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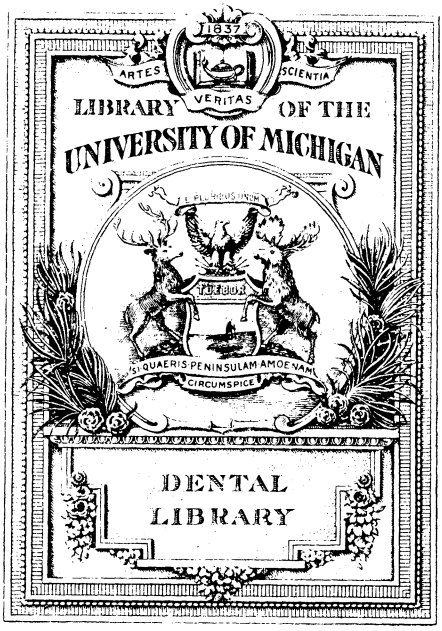
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AMERICAN DENTAL JOURNAL

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LISTERINE TOOTH POWDER

A fourth of a century of continued, satisfactory employment of Listerine has demonstrated to many who have used it during this entire period, that Listerine is the best antiseptic for daily employment in the care and preservation of the teeth. Listerine Tooth Powder, then, is not intended to supplant Listerine in the daily toilet of the teeth, but is offered in response to a popular demand for a frictionary dentifrice to be used in conjunction with this well-known and time-tried antiseptic.

Listerine Tooth Powder is composed of precipitated carbonate of calcium, carbonate of magnesium, oil of cananga, and the antiseptic constituents of Listerine.

The simplicity of its formula, in itself commends the powder. The English precipitated chalk and magnesia are the finest obtainable, and absolutely free from grit; the oil of cananga possesses properties opposed to inflammatory conditions of the gums, and together with the antiseptic constituents of Listerine, adds to the desirable qualities of the product. However, it is to the list of articles which have been omitted from the formula that special attention is directed, and the manufacturers believe the profession will agree that the absence of pumice stone, cuttlefish bone or other abrasive substances, and of sugar, orris root or superficial perfume of any character (the usual ingredients of tooth powders and liable in themselves to fermentative action in the mouth), is a distinct advantage.

Lambert Pharmacal Co.

St. Louis, U. S. A.

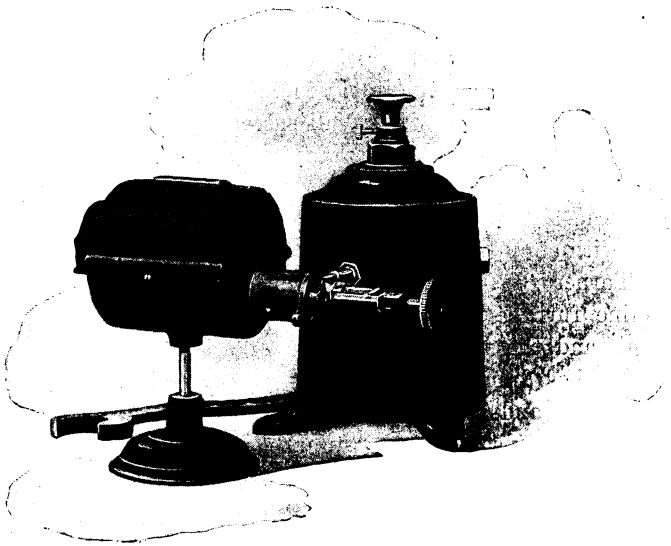
FFR

PORCELAIN.

T. ELHONAN POWELL, D. D. S.

CHAPTER II.

After determining the use of porcelain in your practice the first serious consideration must be given to materials and furnaces. There is a wide range of possible choice between high and low fusing



DR. R. E. BROPHY'S FURNACE.

porcelain and many claims are made for each. So one must decide between them before beginning porcelain work at all. If one decides for the low fusing, it might be well to choose the Jenkins system as a means of simplifying the whole problem, but I should advise against such a choice off-hand, and I shall speak of the reasons later.

The choice of a furnace must of necessity be largely determined

by your location. While there is an ever increasing number of cities and towns establishing plants supplying an electric current, many of our progressive dentists are located where this modern means of power is not furnished.

The ever increasing desire on the part of the profession to employ porcelain as a filling material, as well as for crown and bridge work, has given an incentive to manufacturers to make a furnace which will give the dentist an independence from the electric current. These furnaces are enabling the dentists everywhere to do commendable work, thereby giving to the country clientile the same class of service as that rendered by those dentists who have the advantages of the electric current.

Now, I want to speak briefly about some of the various furnaces offered. One of the first of these to appeal to my appreciation is manufactured by Dr. R. C. Brophy, who has spent much time in evolving a gasoline furnace, which will do all classes of porcelain work. He has succeeded admirably in this effort.

He claims to have eliminated all susceptibility to corrosion and liability to explosion. This he has accomplished by making a furnace tank of cast iron, doing away with soldered joints, and thus enabling it to withstand an exceedingly high pressure. It may be handled by the novice with absolute safety.

The Turner Brass Company of Chicago has on the market several gasoline furnaces which work in connection with a blow-pipe attachment, and the work done by these furnaces is certainly very creditable. They differ from some other furnaces in that the muffle is made of metal and is so placed within the cylinder that a space of $\frac{3}{16}$ of an inch obtains between the muffle and the fire-clay lining of the cylinder. The gas is admitted from an opening in the back, the flame completely enveloping the muffle, then passing up through an opening at the top, thus avoiding any possibility of gasing the case.

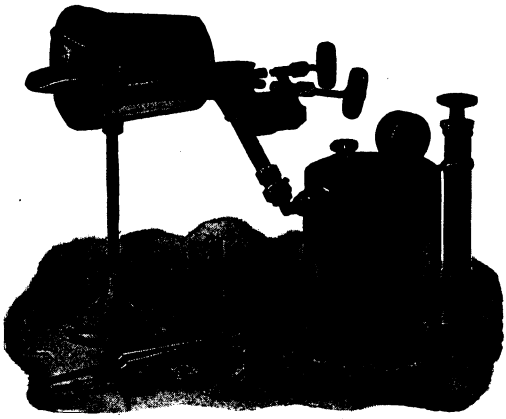
No matter what kind of a furnace you decide to buy your success, or failure, depends largely upon the personal element.

No man without previous knowledge, as to how to handle a furnace, can do successful work until he has thoroughly mastered the technique of that furnace.

Gasoline stoves have been used by housewives for many years, and yet we constantly read of accidents which happen in the handling

of these stoves. We usually attribute the accidents to carelessness; but more often the cause is a failure to fully understand the nature of the materials used and the manipulative routine. Often an accident follows continued use without a proper cleaning, where absolute cleanliness should be observed to avoid an accumulation of obstructive refuse. Even the unintelligent use of the electric furnace will occasion much annoyance and useless expense in the blowing out of the muffle. This is usually caused by permitting metals to melt and drop upon the floor of the mufflle, thus short circuiting the current; or by placing instruments inside of the muffle to change the position of the case without first taking the precaution to shut off the current.

All these details should be learned, and a thorough knowledge of the mechanism of your furnace should be obtained before assaying to use in a practical way any furnace, whether gas, gasoline, kerosene or electric.



TURNER BRASS COMPANY'S FURNACE.

The gasoline furnaces are comparatively inexpensive, costing from $15.00 to $45.00, the price depending upon the number of improvements and accessories accompanying the outfit.

The item of expense in the beginning is an important one, as few men can afford to expend large sums of money on what they might consider an experiment; and while the use of porcelain can no longer be looked upon as an experiment, yet it is human nature to be cautious where a considerable outlay is contemplated.

So, it may be well, if you are a beginner, to secure one of the less expensive furnaces for use during the first year or the experimental stage, even though you may have the electric current.

Some of my friends, whom I consider good porcelain workers, are using with perfect success such inexpensive electric furnaces as the Mitchel or the Bosworth, costing around twenty dollars ($20.00).

These furnaces are suitable for inlays, crowns or small bridges, and the adoption of one of these would make the original outlay comparatively small. But if you want to go into the work earnestly and desire to "burn the bridges behind you," the best porcelain workers would advise you to procure one of the best furnaces that it is possible to obtain, as the best is none too good; because, if a higher class furnace will do better work that is the kind we want, even though it may cost several times the price of the cheaper one. One of the difficulties, which will come to you, will be a change in the color of the porcelain in the baking, almost invariably due to the irregularity in the time the case is exposed to the current. This cause for complaint has been practically removed by the introduction of the pyrometer, which regulates to a nicety the baking time and degree of heat desired for each piece. The pyrometers are sold with the Hammond, Custer, Pelton, etc., but, in my opinion, the most practical one, on the market at the present time, is that one which is the result of the efforts of Dr. F. E. Roach of Chicago, and which is manufactured and sold by Klewe and Company of New Haven, Conn. This furnace is automatic, being constructed with a trigger shut-off, which is tripped by the melting and dropping onto the trigger of a metal whose melting point gauges the whole operation; either lead or gold may be used, it being necessary to set the gauge to correspond with the metal used.

This automatic process insures regularity of baking, obviating the loss of color and friability from overbaking.

These are important points which will be found worth remembering when experience begins to demonstrate the difficulties of the road which we have to travel.

These remarks on furnaces are not made with any feeling of partiality or preference whatever, but are merely suggestions made with the hope of giving aid to the inexperienced in forming a basis for a proper choice. For, after having continued at the work until

you feel that "your feet are resting firmly on the ground," individual preferences will guide you into making such changes as will more readily contribute to your personal comfort in the attainment of your ideals.

As between the choice of low or high fusing porcelain, it is not easy to make a positive recommendation, that depending largely, as so many other things do, on the personal equation.

As for myself, I began with the high-fusing porcelain; my observation having led me to believe that more uniformly high-grade work was being done by the men who were using the high-fusing porcelain.

As the principal claim for low-fusing porcelain was the greater ease in making a gold matrix than in making a matrix out of platinum, I was not favorably inclined toward it.

I have seen some beautiful work done by the champions of low-fusing porcelain both as to adaptation and color; but the average work done with the high-fusing porcelain is, in my opinion, much better than the average work done by those who use the lower fusing bodies.

Any man, who can make a good filling by using the gold matrix, can make a better filling if he will learn to use the platinum and high-fusing porcelain.

The man who deliberately chooses a method of filling teeth because it may be somewhat easier for him than some other method, at the same time chooses to work on a lower plane than his possibilities would permit him to attain.

(*To be continued.*)

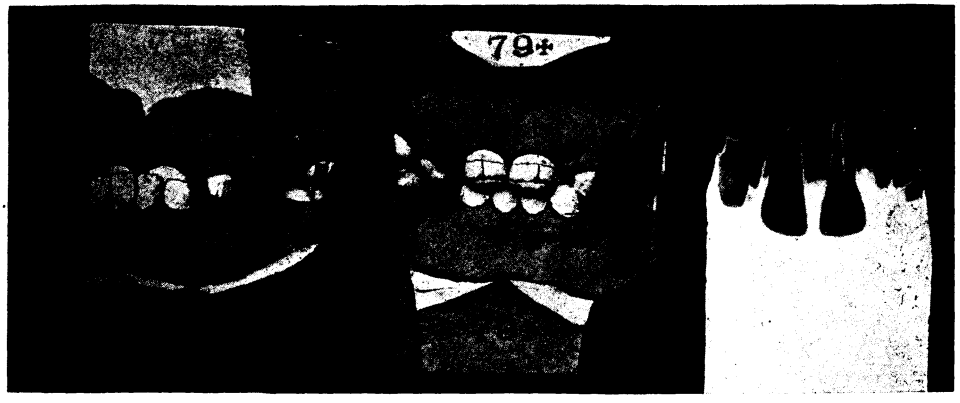
ORTHODONTIA.

BY J. N. M'DOWELL, D. D. S.,
PROFESSOR OF ORTHODONTIA, COLLEGE OF DENTISTRY, UNIVERSITY OF ILLINOIS.

CHAPTER XXIII.

DELAYED ERUPTION.

The effect on the occlusion of delayed teeth is almost as bad as where the teeth have failed entirely to develop. However, such teeth can now be located with the use of the X-ray before they are permanently lodged in the alveolar process, and if it is known that they are developing or are lodged in the alveolar process from a cause, it will then be possible to prevent a permanent abnormal condition from



A. FIG. 1. B. C.

being established by removing the cause, and with regulating appliances space can be made for the teeth to come down into normal position.

"A" of Fig. 1 shows the models of a boy 8 years old. The space for the laterals is entirely closed up. The teeth in both the upper and lower arches were regulated, making the necessary room for the laterals in the upper arch. ("B," Fig. 1.) This space was retained for two years and at the end of that time there was still

no sign of the laterals. External examination gave no indication of delayed teeth, but the result of a skiagraph shows the laterals high up in the process only partly developed. It was several months later before there was any indication of the laterals making their appearance.

A. FIG. 2. B.

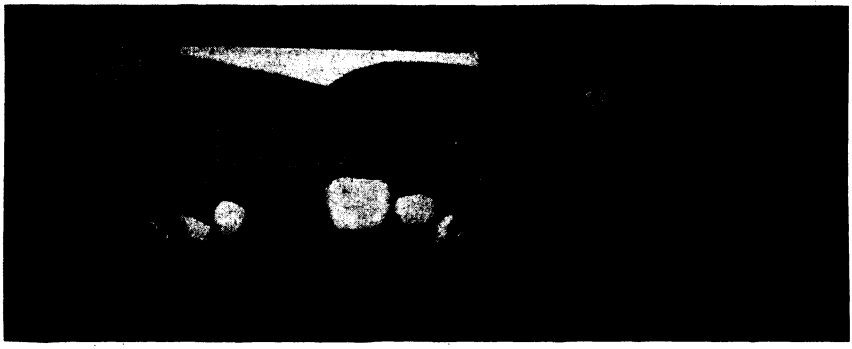
Fig. 2 shows the model of a young lady, aged 24, where the right upper central is missing. The diagnosis is misleading. Seemingly the tooth has been extracted, owing to the depression and absorption of the process at that point, causing a marked deformity in

A. FIG. 3. B.

the occlusion by the contraction of the upper arch as a result of the loss of the central. A skiagraph shows the tooth in position high up

in the process and rotated half way. A prominence caused by the tooth can be felt high up at the conjunction of the frenum labii and the muscles of the lip. The parents did not consent to have it drawn down.

"A" of Fig. 3 shows the model of a young lady aged 11. All the bicuspids have erupted with the exception of the lower left second biscuspids, which was supposed to have been extracted. The space for this tooth is closed up, the lower second bicuspid tipping



A. FIG. 4. B.

backward and being followed by cuspid and lateral. There is inharmony of the arches from the apparent loss of the lower bicuspid, the upper arch having contracted to accommodate itself to the lower, closing up the space for the upper cuspid. It was the original intention in regulating this case to make space by moving the lower teeth toward on that side, truing up the occlusion and placing in an artificial bicuspid, thus restoring normal occlusion and harmony in the size of the arches. After some space was gained there seemed to be indication of a tooth in the process. A skiagraph was taken of the case with the regulating appliance still in position, which shows the second bicuspid far down in the process. Four months later this tooth made its appearance. "B," Fig. 3, shows the change in the occlusion of the case before correction, and after the arches had been enlarged to accommodate the delayed bicuspid.

Fig. 4 is the model from a boy 8 years of age. At the age of 11 months he fell out of a high chair, striking the anterior teeth on some object as he fell. All of the upper incisors were knocked

out by this fall. From this time until the age of 8 years the parents have waited in vain for the appearance of teeth to fill in the large open space on the left side. This skiagraph illustrates what the probable result upon the development of the permanent teeth may

A. FIG. 5. B. C.

result in from falls, blows, etc. The skiagraph shows that the crypt or bud for the permanent central was scattered like a drop of water. The permanent central is developed about one-third, while all around it are small, irregular bits of tooth structure. The right lateral is

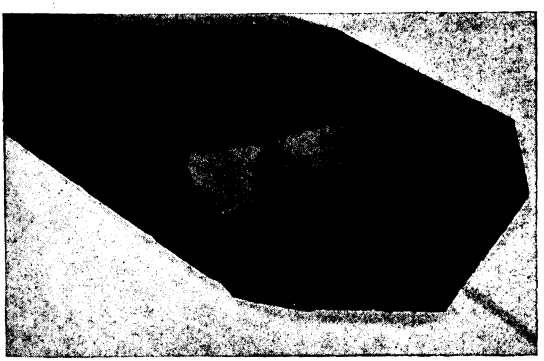


FIG. 6.

bifurcated almost one-half of its length. Undoubtedly these poor, deformed teeth will never erupt. They are not sufficiently developed to forcibly erupt themselves. Consequently the only remedy will be artificial substitution.

Fig. 5 shows a case that was retained for two years after treatment, waiting for the eruption of the cuspid. The eruption of the

tooth was delayed so long that finally a skiagraph was taken which shows the cuspid imbedded deep in the bone.

Fig. 6 shows a skiagraph of a case disclosing a missing third molar. The third molar is delayed deep in the bony structure. Note pulp chamber of the second molar and the large alloy filling in the first molar and the partly filled root canals. This tooth was finally lost as the result of a severe abscess, due to the poor root canal fillings, as shown by the skiagraph.

A. FIG. 7. B.

Fig. 7 shows the model and skiagraph of a case 8 years. The first upper temporary molar is missing, a rare condition with the temporary teeth. The failure of this tooth to erupt at the proper time has allowed the second temporary molar to move forward and the cuspid to move backward until the space for the first molar is lost. The best course in this case would be to make sufficient room to permit the extraction of the temporary molar, if it did not erupt, and then retain the space until the bicuspid erupted.

Supernumerary teeth are usually most aggravating in their results in changing the normal position of the teeth, owing to the unusual position, time and different forms in which they present themselves.

"A," Fig. 8, shows the model of a boy 13 years old, showing two seemingly perfectly developed laterals, with but little evidence of a permanent cuspid. The laterals are identically alike in size and shape. As it was necessary to extract one tooth, making room for the cuspid, the question naturally arose, which one? The preference,

A. FIG. 8. B. C.

of course, naturally would be to leave the lateral next the central and extract the one occupying the space where the cuspid should be. The position of the cuspid is marked "C." The skiagraph taken

A. FIG. 9. B.

of the same case shows clearly and conclusively the course of treatment; the lateral tooth next to the central, marked with a small x, being undeveloped and deformed, was extracted, while the lateral oc-

cupying the space for the cuspid was left, as it was perfect in anatomical construction. The skiagraph also shows the cuspid buried in the process, ready to come down when space will permit. The guiding marks on the lateral, bicuspid and molar of Fig. 8 show the condition of the occlusion at the beginning of the case. There is little or no room for the cuspid to come down. The upper left central is protruding one-fourth inch beyond the other. "B," Fig. 8, shows the condition of the occlusion after the case has been completed. The teeth are in normal contact and the guiding marks on the lateral, bicuspid and molar now approximate. The lateral next to the central was extracted, and the lateral occupying the space of the cuspid was moved forward to normal position and the prominence of the upper left central was reduced to normal.

Abnormal Development. Fig. 9 shows the abnormal development of the upper central incisor, the tooth being so much larger than the other central and the malformation so marked that the parents sought for an early interference. A skiagraph was taken of this case, which shows that it is the permanent central. The permanent right lateral is still developing deep down in the process, and still further down is the permanent cuspid just developing. The abnormal right central is fairly well formed below in the process, with a slight bifurcation of the root at the apex.

(*To be continued.*)

FEVERS.

The arrested activity for the time being of secretion of the glands and mucous membrane during any of the infectious fevers is liable to be the forerunner of some pathological disturbance or render the parts so that they may be predisposed to diseased conditions many years after the individual has passed through a spell of fever. The morbid anatomy of the jaws and teeth, or the disturbed physiological function of the glands and mucous surfaces, may be the result of some one of these acute febrile diseases.—G. W. Cook.

DENTAL PATHOLOGY.

BY GEORGE W. COOK, B. S., D. D. S., CHICAGO, ILL.,
DEAN OF DENTAL DEPARTMENT, UNIVERSITY OF ILLINOIS; PROFESSOR OF BACTERIOLOGY AND PATHOLOGY, UNIVERSITY OF ILLINOIS; PROFESSOR OF ORAL SURGERY, DEARBORN MEDICAL COLLEGE.

In dealing with the problem of infection and infectious conditions that are common in the animal kingdom, especially in that specie of the animal kingdom known as man, we have a number of phenomena that are peculiar only to the human race. Infection of the human body is said to be, by some of the best authorities, a condition in which a foreign agent, in the form of a parasitic life, successfully enters the tissues of the body. This does not include the parasites of a bacterial nature that have their existence largely in the oral cavity or digestive tract. There are in fact a number of external openings of the body in which certain forms of bacterial life may quite constantly inhabit these cavities without producing a diseased condition. But if at any time any one of these organisms enters into the tissues or establish through their processes a substance that is absorbable into the tissues and establish a functional change of a part, or possibly the whole of the body, we can then say they are disease producing; although many times under certain circumstances they may be classed as non-pathogenic in their general characteristics, so far as their ability to enter tissues and produce changes detrimental to the normal functional activity.

We have previously pointed out the part played in metabolic processes of the anabolic and kaetabolic changes that are constantly going on in the tissues and cells of the body. When anything interferes for a sufficient length of time to produce changes in the function of the body, we then have a disturbed condition which may be classed under the head of disease. For instance, when a disturbance in the cellular processes associated with oxygen absorption and carbon dioxide excretion sometimes takes place, we then have established an interference with cell respiration in which the exchanging of gases is unequal. Therefore we have a disturbance that may bring about pathological changes in the tissues and cells of the body. If we do not have under these circumstances fully established morbid con-

ditions of the tissues and cells we have them rendered in a predisposing condition, whereby it is possible for certain parasitic forms of life to more easily enter the body and create a purely infectious condition.

There is a condition known as asphyxia which is an insufficient oxidation, and is recognized by the occurrence of carbon dioxide poisoning. When an excess of oxygen is introduced into the body it accelerates cellular energy, which causes rapid oxidation and thus produces an over activity of the part. Such a condition locally may result in an overgrowth of certain cells and tissues, and in this way produce the well known pathological appearance of hypertrophied tissue, or it might produce death to the cells and in this way bring about necrosis. Asphyxiation or suffocation is insufficient oxidation and poisoning produced by carbon dioxide. It is so well known that an animal cannot live without oxygen that it needs no discussion here. On the other hand it is so well recognized that an animal cannot live in an atmosphere of carbon dioxogen, that a discussion of that phase at this time would be of no use. When the lowest form of animal is placed in an atmosphere of carbon dioxide it very quickly succumbs and soon dies.

The respiratory action of the animal kingdom is sometimes depressed and sometimes increased. When the respirations are accelerated we have a condition called dyspnea. This condition is oftentimes due to some pathological changes in the heart and lungs, and for some mechanical reason the blood becomes charged with carbon dioxide. The quantity of the poison may only be sufficient to stimulate the respiratory centers of the brain, and in this way call into action certain accessory muscles of respiration; the blood is not properly oxygenated and then ensues an appearance of blueness of the skin, especially of the face, lips and finger tips—thus we say the individual a cyanotic.

We have an opposite condition to the one just described which is a forceful inspiration of an excess of oxygen accumulating in the blood. This, however, in most cases is reflex and does not depend so much upon the oxygen alone as when nitrogen and hydrogen are inhaled under the same condition. The term applied to this condition is apnea. As we have just said, this condition is different from the one described, in that it fixes the responsibility of respira-

tion on the accumulation of too much oxygen, and there may be brought about a rise of temperature. This brings us to an important phase of pathological conditions whereby the temperature of the body is increased.

Fever is a term whereby the clinical aspect of certain processes of the body may be characterized as pathological. An increased temperature always causes acceleration of oxygen combustion in the animal organism, and is alluded to by a term known as pyrexia. This condition is differentiated from the one known as hyperthermic. The last named term is applied to certain nervous lesions whereby the temperature is increased beyond that usually recognized as fever, but there is little obstructive oxidation of the tissues.

In fever there may be two etiological factors for the cause of a rise of temperature, traumatism and infection. The real cause of a rise of temperature in traumatism has never been very well explained. Infectious fever must depend upon a micro-organism successfully entering the body and producing some changes, either by the irritated action of micro-organisms or their products. It has been found that the temperature is readily increased by certain parasites that belong to both the vegetable and animal kingdom. Malarial fever is one that is usually produced by the presence of an animal parasite, which is called haemameba, while such fevers as typhoid, pneumonia and tubercular are produced by bacteria. In the majority of cases of infection the rise of temperature is due to some toxic disturbance of the nerve centers, which are concerned to a more or less degree in the heat regulations of the body. Those conditions in which the toxines have a specific affinity for the thermic centers usually manifest themselves by a very high temperature. It has been found that by injections of peptones and albuminose into the fluids of the body it is possible to produce fevers.

The mechanism of fever is a complex process. The occurrence of fever seems to depend upon the irritation of the heat apparatus of the body. The rise of temperature may be very slight or it may be of such an elevated nature as to produce alarming symptoms.

There are certain characteristic changes that arise from an increased temperature that it is sometimes very difficult to know whether or not the change of tissue is the result of the fever, or

whether they are the phenomena that occur with the conditions that produce the fever. There is one observation that has been quite clearly brought out and that is that combustion, or the interchanging of gases or cell respiration, which it really should be called, is a phenomena that is not by any means well understood.

In fever we have shown that the erthrocytes are very rapidly destroyed. Some authors believe that hemolysis is the principal feature of fever. The urine is usually dark, the color being due largely from the pigment liberated from the red blood corpuscles. Alkalinity of the blood is usually diminished. Minkowski found, experimentally, on dogs that in a rise of temperature he was able to extract lactic acid from the blood, and that the alkalinity of the blood was in proportion relative to the degrees of fever. Leucocytosis is present in fever and the fibrin of the blood is increased, and the parenchyma cells are found in certain organs in a state of cloudy swelling. In long continued fevers the heart and voluntary muscles show degenerative changes, and the striation of muscular fibres are completely lost; they break down into a homogeneous mass and rapidly disappear. Fatty degeneration of the heart muscles is also one of the results of fever. All the functions of the body are disturbed. The cardiac action sometimes may be so rapid as to make it quite impossible to count the pulse.

In such infection as scarlet fever there is usually a rapid pulse, but in typhoid fever there is a slow pulse. The blood pressure varies according to the excitation of the vasomotor system. The respirations are also increased and may be shallow and deep, depending somewhat upon the location and extent of the disease. The glandular tissue is in the majority of instances changed in its functional activity, and the excreting glands are usually diminished in quantity of the products excreted. The gastric juice is said to be reduced in quantity, and the acidity is lessened very materially. The salivary glands are usually scanty in quantity and of a ropy, sticky consistency. The liver is usually in a swollen state and cloudy in general appearance, and the bile is diminished in quantity. When the bile and intestinal secretion are arrested in quantity, which is nearly always the case in fevers, constipation is the result. Therefore in alveolar abscesses of an acute and severe nature, a cathartic should always be administered.

In the majority of infectious fevers the skin is hot and dry, and when the temperature has about reached its climax perspiration may be abundant for some little time. This is usually spoken of as the crisis in fever. The urine is scanty and has a high specific gravity; it is dark in color and many times contains traces of albumin, and petassium salts are usually increased with the diminished quantity of chlorides. The sulphates are many times increased in quantity.

The secretion of milk is usually diminished both in quantity and quality, and it often happens that a nursing child is affected when the mother is suffering from some febrile disturbances. The nervous system is many times affected, which is indicated by headaches, pain in the back and extremities. Sometimes a patient suffers with considerable nervous disturbance. The secretions are very much disturbed and many times shows exactly what is going on in the tissues of the body during fever. There is an increased quantity of oxygen; this establishes exhilaration of exchanging of gases, which may be quite rapid in the early stages of the fever, with a diminished activity as the fever progresses.

All of the conditions herein described may be present in alveolar abscesses and many of the infectious conditions of the oral cavity. During all the processes of acute infectious diseases a disturbed secretion of the salivary glands and the mucous follicles of the oral mucous membrane may all be so changed, qualitatively and quantitatively, that it brings about a favorable condition whereby certain tissue changes may occur around the gum margin in the interproximal spaces. Owing to the changes of the secretions this will bring about a favorable environment of bacteria, and in this way be the initial disturbance for certain inflammatory processes to be established in the localities just mentioned; there causing disintegration of tooth substance and inflammation in the gum tissue.

These acute infectious diseases may be the direct or indirect causes of erosion of the teeth, caries of teeth and inflammation of the gingivæ and peridental membrane. These may follow late in life as the direct result of diseases of early childhood. The acute febrile diseases occurring in childhood during the formation of the teeth and jaws manifest themselves in mal-formed tooth structure, or anatomical derangement of the teeth and jaws later in life.

(*To be continued.*)

OPERATIVE DENTISTRY.

BY R. R. TULLER, D. D. S.,
CLINICAL PROFESSOR OF OPERATIVE DENTISTRY, CHICAGO COLLEGE OF DENTAL SURGERY.

SHOP TALKS No. 15.

MORE ABOUT GOLD INLAYS.

The day has gone by, with quite an army of dental practitioners, when large gold fillings, or even medium ones, are hammered into teeth; since, as before has been said in these pages, gold inlays can be produced and inserted with a saving of time, strain and discomfort on the part of both the patient and operator, and at the same time perform a better service for the patient than in most cases could be done with the hammered-in gold filling.

And when people understand that the discomforts of the dental chair are largely overcome by the inlay process, together with short sittings and better work they are going to seek out the operator that practices that way, for the time consumed and tediousness of things generally in prolonged sittings, aside from the real pain of clearing the tooth of decay, are features most everybody longs to be rid of. A host of people stay away from the dentist just as long as they can on account of these unpleasant things. Under these circumstances it is our *duty* to eliminate all the discomforts we can.

Several ways of making gold inlays have been explained from time to time in previous issues, and some seem to have so many complications that operators not familiar with making them, hesitate to undertake them. But the most complicated require a good deal less strain and labor, and often skill, than making large gold fillings, while some are surprisingly easy to make.

One of the easiest for anyone to make is made as follows: It has been told before but will bear repeating. The cavity having been prepared with proper consideration as to withdrawing a matrix (which is generally understood) take No. 4 gold foil and fold it about six times to make a square of sufficient size for the purpose—that is, to dip into and cover the walls of the cavity and have some overlap. This when folded may be pressed upon itself pretty thoroughly with

a spatula. After rubbing the cavity with talcum the gold should be carried into it and to the floor of the same with a blunt instrument. Cotton pellets should then be packed into it to expand it to the walls. When adapted to the walls the margins should be covered by pressing the gold down over them with a good sized wad of cotton, after which a little careful attention is necessary to adapt the gold exactly to the margins by special pressure and burnishing. (If preferred a matrix of either the usual rolled gold or platinum may be used.)

Now, with cotton removed, a portion of a sheet of gold may be just wadded up in the fingers (the endeavor being to have a quantity sufficient to fill the cavity with considerable firmness) and packed into the matrix, being careful not to tear the latter. This may be hurriedly done, not being condensed at all as in filling, but firm enough to make good contact with the matrix and particularly at margins, and enough should protrude from the cavity occlusally to enable the patient to close the teeth, producing the bite in the gold. The approximal surface should also be molded and shaped with burnishers exactly as the finished inlay is desired.

Now the matrix with contents should be gently teased partly out and set back again once or twice, refitting margins each time if distorted, so that when finally removed, little or no effort is required. Handle carefully, so as not to disturb margins, and after wetting sink gently into a little pyramid of fine investment thin or soft enough to require no force. Let the investment cover all but the surface (occlusally generally) where solder is to be added. This will soon harden so that soldering may begin. The whole investment and contents should be heated to a degree that will let the solder, under the blow-pipe flow or soak all in through the gold foil. As long as the melted solder disappears in the gold, keep adding more until it shows well over the surface. Eighteen karat solder is fine enough.

If crystal gold may be used to fill up with instead of foil, it is preferable, for the reason that it may be more deftly and perfectly molded at the occlusal and approximal contours.

The soldering done, remove investment, trim and finish up the exterior surface. Little has to be done if the soldering is not overdone nor underdone. If just right, which experience will determine, the indentations of the bite remain though the surface is solid and hard. If desired a hole may be drilled or burred at the pulpal wall to any extent desired toward hollowing out the inlay. This hollow,

filled with cement when set, renders the inlay less susceptible to thermal changes.

Probably the most perfect inlays made of gold are by the new Taggart process, but which requires a special outfit by which to make them. The first steps in this, after cavity preparation, is to make an inlay of a specially prepared wax which is made in place in the cavity, and may be molded to any form desired and a bite secured in same, being particular to finish this wax model with all the detail desired in the finished gold inlay. This model is then lifted from the cavity by inserting a wire into it. Before lifting out entirely it should be pressed back to place again once or twice to make the final removal easy and without dragging. We now have a wax model on the end of a wire. This is taken and invested, or rather a very fine investing material is delicately worked around it until it is well enclosed without a bubble or fault. After this has hardened up some, it is set in a prepared ring or flask and more investment poured around it, leaving the wire protruding. When this has hardened, which is hastened by heating, the wire is withdrawn and the heating goes on until the wax model has melted and is absorbed in the investment.

Now where the wire was, there is an opening into the mold, and the investment is cupped out at this point. When the case is hot enough an ingot of gold large enough to make the inlay and more is put into the little cup or crucible, and an oxy-hydrogen flame is turned on to it. The gold is not only melted but boiling in a moment or so with this intense flame; then, by the Taggart device, the flame is switched off, the flask closed air tight and compressed air to about 30 pounds pressure is switched on all in one quick movement, and in the same instant the liquid gold is sent into the mold by the pressure and kept under it until it has cooled down, which takes no appreciable time, since the investing material is never heated high enough to endanger its continuity by checking.

Now, when the investment is broken up we find the wax model reproduced in gold to the faintest line and with a finish equal to that given to the wax model. That means polished and complete (if the wax has been polished) except where the stem of gold attaches where the wire was. This is nipped or sawed off and the spot finished off in a moment.

Many attempts to make cast inlays have been made, but until now none were much of a success. To show how perfectly gold could be cast in molds of intricate shape, Dr. Taggart in one of his demonstrations made a little rope of his wax, tied it in a knot and reproduced the knot perfectly in gold in a few moments. Its possibilities in other arts than dentistry and with other metals than gold if desired, make the invention a most important one. It is very important in dentistry and marks an era, possibly, when the old hammered-in gold filling will rapidly become obsolete, or used only in cavities too small and insignificant to attempt inlay work.

This will prove a boon to humanity, for aside from elimination of the rubber dam and tediousness long drawn out in packing cohesive gold, the inlay will preserve a good many more teeth than has the usual gold filling. With a perfect inlay to restore lost tooth structure, and especially posterior teeth, greater extensions for prevention can be more freely made. A great many teeth that have been relegated to the gold shell crown as the last resort, may now be better taken care of with a Taggart inlay. A big one can be made as quickly as a small one and usually with greater ease. Any kind of a cavity that wax can be fitted to and drawn away from without any change of shape of the wax, may be reproduced in gold in the minutest detail. In large restorations it will be possible to increase the anchorage when desired, by putting pins in the wax and around which the gold would then be cast so that dangers of dislodgement may be almost entirely overcome.

As yet the Taggart outfit is not on the market, and when it is the expense will no doubt be something of an item. The inlay first described may be made with the facilities found in any dental office; and after familiarity with the process and some experience in the details, they can be made very quickly and very accurately, and especially with crystal gold filler which is more easily placed and molded than foil. The investment material should be fine and cover all but the occlusal where solder is introduced.

(To be continued.)

ORIGINAL CONTRIBUTIONS

TOOTHSOME TOPICS.

BY R. B. TULLER.

A SKILFUL OPERATION—SURE!

Gentlemen, the surgical clinic which I shall give before the class this morning, and shall talk to you about, is an operation to relieve the diseased and suppurative conditions of the antrum of Highmore.

You remember, gentlemen, that we diagnosed this case the other day, and satisfied ourselves that there was a condition that required an operation, so it is needless to go through that again; for we decided then just what was necessary to do, and how to go about it. We discovered that this trouble in the antrum was due to an abscess at the root of a molar. The apical portion of these upper molars are frequently near to, and in some cases practically protrude into the region of the the antrum, being covered only by a very thin tissue that forms the floor of that cavern; and if the tooth becomes abscessed at the apex of one of these roots the disturbance involves the antrum and the discharge breaking in, infects the susceptible condition there, and if neglected most serious results may follow.

The old way of getting into this antrum was to remove the infected tooth, and sometimes possibly a sound one, and enter by enlarging the root socket.

In this case, if it were at all necessary to remove the tooth, we might possibly succeed in opening into the antrum and treating successfully, and particularly if the thing was of recent development. But this case we find has been of long standing, and since by modern methods we can treat the tooth and restore it to health and usefulness, we must enter the antrum in another place to discharge the contents and introduce antiseptic and disinfecting medicaments. In most cases I prefer to open into the antrum, as I shall this, outside the teeth and alveolar ridge in the region of the canine fossa; for the reason that there is more certainty of successful issues, and especially if we open heroicly, making an opening large enough to be enabled to remove all debris and everything foreign to the return of health.

As a rule the walls of this cavern are thin at this point and it

is easier to trephine here than following a root socket. Now, it has been found wise to make this opening large enough to be able to explore the cavern with the little finger—or even the index finger, for the reason that it is frequently found that the floor of the antrum is partitioned off by bony septa that rise high enough to retain more or less pus and debris that so held is not easy to get rid of by the usual means of drainage, and as the septa are of no consequence, and the bony tissue possibly diseased, they should be broken down and cleared out, giving a clear field for irrigation and proper drainage. In no way can this be done much better than by introducing the finger and through the sense of touch and feeling locate and break them down, they being, usually, frail.

In operating here I shall make a large opening, as you will observe, by the size of the trephine I am about to use. This is made to go into the hand-piece of our dental engine and after our patient is under the influence of the anesthetic, a few rapid turns will cut into the cavern, and all that follows may be pretty quickly done.

The patient now being ready we will proceed with the operation. My assistant will retract the muscle orbicularis oris with a suitable holder, as you will see, exposing the area in which we wish to work, and note the care with which instruments are sterilized and all antiseptic precautions taken. I first make incisions in such a way that the soft tissues may be dissected or drawn away. Now a few turns of the trephine brings us into the cavity, and, as anticipated, we have a voluminous flow of bloody pus. I now irrigate with injection of a mild antiseptic. There are a number of antiseptic washes that may be used, but they should not be strong or irritating, as the roof of this cavern is the floor of the socket of the eye, and that delicate organ and its surrounding tissues are very susceptible to irritating medicaments. I am using now a solution of boracic acid, and using it profusely.

I come now to the exploration with the finger, and my finger, as you see, has been covered with a sterile rubber sheath. This eliminates the possibility of carrying any infection which might be lurking, with all our care, under the finger nails. I find, as I explained, the bony septa or partitions and with little effort I can break them down and remove them. Now, after irrigating again, I proceed to insert this drainage tube made of silver slightly flaring, like a horn or funnel, at its upper end. As we look at it, it is too large at this flaring point to pass in, but it is slitted the entire length

and by pressing, its circumference can be reduced and when we have passed it in, it springs open again and the enlarged end keeps it from dropping out or being easily dislodged. This will retain our opening as long as we desire and permit of free drainage. For the present we will leave it entirely open. Further on in the treatments we will close the tube with cotton or gutta percha perhaps to keep out saliva.

From all indications, now, we shall have marked improvement right away and rapid recovery; if the tooth which originated this trouble is properly dealt with in the infirmary. The roots of the tooth should be well cleaned and irrigation or medicament conducted through them into the antrum following the sinus made by the pus. After this has been well done, the roots should be carefully filled with gutta percha in the usual way. That part of the work I leave in the hands of student Goodfellow, with the admonition to do his part carefully, for on the success of his work depends the success of mine. If the abscess is not healed the antrum will not get well.

Now, gentlemen, this concludes the operation and I am sure that when the patient recovers from the anaesthetic he will feel greatly relieved, and perhaps by tomorrow he can go to work. In conclusion let me impress you, young men, that you cannot be too painstaking in your diagnosis. There are disturbances of the antrum frequently, that need no operation. It will become easy and normal when the sore tooth has been duly treated and brought to health. Quite too often operations are performed on the antrum when they are surely not needed. You remember the symptoms I looked for the other day. We found plenty of pretty reliable ones, but the best test, probably—the one to be most relied upon to know whether to operate, is, as I showed you gentlemen, to darken the room and use the electric mouth lamp. You remember that when the lips were closed, the whole face was aglow like a lamp, except in the region of this antrum, where a dark shadow was distinctly visible. This was due to the opacity of the pus and turgid conditions that needed just what I have done to relieve it.

Mr. Jones has now recovered from the anaesthetic and I have no doubt he is greatly relieved. "How do you feel, Mr. Jones? Better I am sure?"

"Can't say I do," replied Jones.

Then as his hand strayed in a somewhat bewildered sort of way up his sore face he suddenly made a wild jump and exclaimed, "Great

heavens! Professor Sanguine! What have you done? You have operated on my good side!"

Such sometimes are the misfortunes of a capable operator—a real genius.

BEAUMONT, Tex., March 23, 1907.

Editor American Dental Journal:

My attention was recently called to a short article in the January number of *American Journal of Dental Science* copied from "Magazine," and originally written by one Dr. Hefflen. Dr. Hefflen attacks several nostrums on the market, naming them. Among those he mentions is my preparation "Nerve Qui-e-tus" for obtunding dentine and devitalizing and nummifying nerves of teeth. Dr. Hefflen condemns the use of Nerve Qui-e-tus and all other preparations whose component parts are not made public. He then proposes to enlighten the profession by naming the ingredients of "NERVE QUIETUS" and the others. The liquid he says is composed of formalin and creosote and the powder of dry "alum, thymol and oxide of zinc."

What an analysis of Nerve Quietus! This excellent compound does not contain one trace of any drug he mentions. He admits that "it may be compounded in good faith" (which means that it may be all that is claimed for it), but because he don't know its composition he rejects it. It is the same old story of the Serpent in the Wilderness. Though "only a look" would save them, those obstinuate Isrealites refused and died, because they did not understand "why."

There is reason for refusing to use freely a new compound that has not been tested, but when a remedy has had fifteen years' test in thousand of cases it is wrong and detrimental to progress to decry it simply because its composition is kept a secret, so that the discoverer may reap a reward he deserves—something besides human praise. The man who first recommended arsenic as a devitalizer became the butt of ridicule from every source. Even Dr. Harris, the founder of Baltimore College of Dentistry and the author of that best of text books, Harris' Principles and Practice of Dentistry, attacked the promulgator of arsenic as a devitalizer. Arsenic is good. But "Nerve Quietus" will be its successor, and I hope yet to learn that even Dr. Heffler, like Dr. Harris, will be broad-minded enough to try something new, just because other dentists recommend it.

I trust you will give this space, that justice may be done a worthy effort to bless humanity. MILES O. PERKINS.

ABSTRACTS AND SELECTIONS

SOME REASONS FOR INSTITUTING A PUBLIC MEANS OF PROTECTING THE PROFESSION AGAINST THE USE OF POOR ALLOYS.*

BY MARCUS L. WARD, D. D. SC., DETROIT, MICH.

It was with some reluctance that I consented to appear before this society and present the oft discussed, by many much despised, and yet little understood subject of dental amalgam alloys, lest some of your members who are conspicuously well informed on this subject offer adverse criticism to my work.

I confess at the outset that I am human, consequently not infallible, but, in return, I beg you to acknowledge that the incentive to criticism does not necessarily imply wisdom on the part of the critic, and often, not even good faith or truth if he is interested in the manufacture or sale of alloys.

Everyone who is acquainted himself with the history of dental amalgam alloy knows at the beginning, that a work of this kind, which is intended to divulge some of the so-called trade secrets which have so long barred its progress, will be encounted by numerous difficulties, and is not deserving of censure where kindly criticism would serve to better educate the profession.

It is therefore my sincerest desire that all sectional differences and petty jealousies be laid aside and those who owe everlasting debts of gratitude to their preceptors and teachers, will pay them in other ways than by defending their alloys without well founded reasons for the same. Let each one add his mite, that this meeting of one of the best informed societies in this country be a profitable one to the profession.

With the advent of a public means for testing alloys, as recently suggested by Dr. Black, there is marked the final decay of some of the wilful misrepresentations on the part of some of the manufacturers, baseless accusations of dishonesty on the part of others, and censure to writers on this and other similar phases of this subject.

*Read before the Chicago-Odontographic Society, January, 1907.

There is little doubt but that this is one of the conditions that has retarded our progress for years, and if continued after a public means has been provided for testing, will prove a boomerang that will rebound only to smite the throwers.

We can conceive of an article of this kind working a hardship on the makers of inferior products by giving information to the unskilled, whereby they may begin the manufacture of a product for competition.

It is from this element only that I expect criticism for telling what I know, since the better manufacturers are being isolated by such work, and are receiving their reward for conscientious efforts.

If we were to ask the profession today why a gold filling was better than an amalgam filling, what per cent would reply with intelligent answers? It would be surprisingly small indeed, but the blame cannot *all* be placed upon the manufacturers who have thus wrangled and quarreled.

While we have all seen and read many of the ridiculous claims made by the makers of some of our alloys, and listened to the pleading of their agents who are so solicitous of our welfare, we cannot place our *own* ignorance and disappointment at results obtained by using their products at *their* feet.

We must trace this condition of affairs to our own doors, because no one in the profession has brought the subject to a scientific basis which compares real favorably with those in the associated sciences. Neither have the teachers in our dental colleges been able to present the subjects like teachers in engineering are teaching the alloys of steel, brass, etc.

We should for the present, at least, have some means of knowing whether an alloy is reliable or not, without having to wait the test of time in the mouths of our patients. We should at least know the composition of our alloys, the reasons for inserting some metals and excluding others, and the manipulation necessary to bring out the best qualities.

The physician cannot combat disease by giving some la grippe tablets for la grippe, rheumatism tablets for rheumatism, and so on through the list of ailments. He must, first of all, know the composition of the tablets and the action of each ingredient. Second, he must have confidence in the maker of the tablet to place in them what he has labeled on the bottle.

While many of the greatest of the world's physicians are still inscribing their loftiest thoughts in the form of prescriptions, they, too, are using ready-made prescriptions in the form of tablets, capsules, etc., but in every case the composition is known and the maker must be one of repute. Do we combat disease with alloys of known composition? No. What would it avail us anyhow, since only about one in every hundred knows the action of each ingredient, and understands that with dental amalgam alloys other things than the right composition are required to make a good alloy. Do we always buy alloys from makers in whom we have the utmost confidence? A few do, while hundreds are buying and using almost anything that comes along, this being particularly true in the smaller places.

It is not uncommon to see men using alloys made by those whom they would not trust with any other operation. I know of some makers of alloys whose average intelligence is far below par, let alone any special training necessary to enable them to make perfect products, and yet scores of dentists are using their alloys.

Can we imagine a physician prescribing drugs made by a man who does not know quinine from arsenious acid? No. But we can find a similar condition of affairs in our profession regarding the sale of alloys.

It is obvious that there is little analogy between the two so far as danger to human life is concerned, but the idea of professional men buying supplies for mercenary or other reasons from manufacturers who had better be pushing a wheelbarrow is the same. It is the excuse for their existence.

Scores of times have I been told by dentists throughout the country that they could see little difference between the alloys made by the "hinky" dealer and those made by one who had a reputation at stake.

While this is true with a great many, there are few who are closely observant and are able to distinguish between the two after some little time. The men who are unable to distinguish between the two classes of alloys, as a rule, do not use any one make long enough to become familiar with its working qualities, nor to see the results of his labor before he is trying some other make.

They are affording themselves every opportunity to change, and continually expecting to find that some fellow who could not make a living in practice, nor whom they would trust with anything else,

to have discovered an alloy from which all the hitherto objectionable features had been eliminated and all the desirable ones added. How ridiculous for men to practice for years aimlessly buying and blindly inserting anything that comes along with little or no concern for the safety of the teeth which have been intrusted to their care.

It is to be hoped that such men will, in the near future, be given a chance to conserve the energy which they have been expending in searching for better alloys, and apply it to the arts of observation, that the next few years will not be ones of turmoil and impeded progress to them, with no entries on the credit side of the book to represent benefits received.

We have some makers of alloys who, while they differ somewhat as to what constitutes a good alloy, are putting their best energies into experimenting and manufacturing good alloys, that they may maintain the reputation that they have made in this and other lines, while on the other hand we have other classes who have begun manufacturing alloys with no training whatever, who have made little or no progress since beginning the work, who admit that they are "in it" for the money, and yet they are just the ones whose highest ambition is to discredit the profession, depreciate the motives, and disparage the achievements of one who attempts a work of this kind.

I have in mind a man who began by selling a few specialties made by others, but in a short time began making his own specialties, among which were dental alloys, because he was not satisfied with the profits of selling alloys made by experienced men. The ignorance that he displayed was horrifying, to say the least, and would require too much space to be given here, though he is selling pounds of alloy.

It is with pride that a public committee for investigation would keep the alloys made by such men as extinct as possible, till their maker merited the recognition of a manufacturer.

CONSCIENTIOUS MANUFACTURERS DIFFER.

It is quite evident that many of our makers of alloys whose past reputation and attitude toward the future are beyond question differ as to what constitutes a good alloy.

There is made in this city an alloy which with many others I have watched closely and analyzed several times during the last three years. Its composition has approximated silver 68 per cent, tin

26.50 per cent, copper 4.20 per cent, and zinc 1.30 per cent every time I have analyzed it. There is another one made not far from this city which I have found to contain 65 per cent of silver, 27 per cent of tin, 4.50 per cent of copper, and 3.50 per cent of zinc.

Let us notice that these two alloys conform quite closely to the general rule—that our best hard alloys contain from 65 to 68 per cent of silver, 26 to 28 per cent of tin, 3 to 4½ per cent of copper, and 1 to 2½ per cent of zinc.

Let me repeat again that I firmly believe that each of the manufacturers of these two named alloys is honest in his conviction that he has a better product than his competitor.

After some observation I am led to believe that each one is justified in making such claims, though I wish to qualify the statement by saying that each one is measuring the quality of his alloy by a different standard.

The maker of the first alloy who places 68 per cent of silver in it, and cuts it coarsely, gets a product whose crushing resistance, when first made, is approximately 500 pounds on a filling one-eighth inch in diameter and one-eighth inch high, while a filling of the same dimensions made from the second alloy will fall at least 100 pounds below the first.

Obviously, the maker of the first can claim superiority over the second in this one particular, viz., strength. On the other hand, the maker of the second who places 3.50 per cent of zinc in his alloy and cuts it finely obtains a product which works a little easier, sets a little slower, and retains a little better color in most mouths, due to the fact that the sulphide and oxide of zinc are both white.

Obviously, he claims superiority over the maker of the first in this respect. He is correct, since the strength of his alloy is sufficient to resist the ordinary forces of mastication, and the setting qualities are such as to afford a little more time to insert the filling, rightfully claiming that many a filling was a failure because the alloy set too rapidly.

This comment applies to these two alloys as they are being made today, and is not intended to be a comparison of them when cast, cut and annealed, under different conditions.

Both of these alloys are free from shrinkage, hence no claims of superiority are made by the maker of *either* in this respect.

The maker of the first claims that zinc is the disturbing element in our alloys, and must be kept down to about 1 per cent or the filling will expand indefinitely, resulting in spheroided and otherwise distorted fillings with protruding borders. The maker of the second believes the same thing about the action of zinc, but let us notice how he prevents these indefinite expansions and continues to use 3.50 per cent of zinc.

This brings us to the question, why does zinc cause these indefinite expansions? From what evidence we now possess we must assume that dental amalgam alloys composed of silver, tin, copper and zinc, in the proportions previously mentioned, are not definite chemical compounds with properties differing from the constituents of which they are composed.

We know that most metals are capable to some extent of existing in a state of chemical combination with each other, but, as a general rule, they are united by feeble affinities, for it is necessary in order to produce energetic union that the constituents should exhibit great dissimilarity in properties.

It is probable that these metals do unite in definite proportions, but, since they dissolve in all proportions in the melted metals, and we are able to identify the action of each constituent in the finished product, it is indeed difficult to say whether they are solidified solutions of one metal in another, mechanical mixtures, feeble chemical combinations, or a mixture of all three.

However, we have plenty of evidence to show that a portion, at least, of each constituent retains its properties through the melting and casting process and exerts either a beneficial or detrimental effect upon the finished product in the same manner as the constituent itself is beneficial or detrimental.

The amalgamation process as practiced by dentists is only a partial one. We can readily see that mercury will not completely dissolve alloys cut as coarsely as we are getting them at present unless the temperature is high or a much longer time is spent in working the alloy and mercury.

Most operators triturate the alloy and mercury until they are coherent enough to be turned into the hand. They then work it in the palm of the hand a little and pack it into the cavity. The result is that only the surfaces of each little particle of alloy are attacked

by the mercury, leaving a large portion of each particle undissolved.

These undissolved particles, rather than any one constituent, are the real causes of the unstability of our amalgam fillings, because the mercury in loose combination with the tin, and the excess which is mechanically held in the mass at the time of mixing, continues to break down the undissolved particles for months after the filling has been inserted, thus increasing many times the movement which accompanies the mixing of the alloy and mercury, whether it be shrinkage or expansion.

With this in mind are we to be chagrined at finding some of our fillings which gave slight expansions at the time of inserting to be spheroided or otherwise distorted in a few years? And can we not see that the metals which unite with mercury at ordinary temperature are the ones which facilitate the breaking down of any undissolved particles of alloy?

The metal which unites with mercury *most* readily at ordinary temperature is zinc, hence, the maker of the first named alloy who says that zinc is the disturbing element because it does not lose its identity in the melting and casting process, is partially right in the assertion, but the maker of the second who continues to use larger percentages of zinc and cuts his alloy much finer, overcomes much of this action of zinc by obtaining a more perfect amalgamation at the time of inserting the filling.

After keeping these two alloys under my observation for nearly two years I became convinced that there was little difference in the two so far as stability was concerned, though you will see that there is more than double the amount of zinc in one, that there is in the other.

LABORATORY TESTS AT DIFFERENT TEMPERATURES.

Laboratory tests which are carried on at room temperature are not quite practical; because they do not indicate *how much* movement takes place. They do indicate, however, whether the movement is shrinkage or expansion, thus enabling the maker to protect us against a possible occurrence of the former.

A given bulk of an alloy which expands 1-10,000th of an inch at room temperature in a given time will almost invariably give a greater expansion in the same time if the test is kept at possible mouth temperature, viz., 120° F. to 140° F.

The analogy between this, and aiding other chemical actions with heat, thus becomes quite apparent. These two alloys were purchased in open market and six fillings made from each one. The proportions of mercury and alloy were carefully determined. These proportions were weighed out for each filling and triturated in a mortar 1¼ minutes, after which they were worked in the hand 3½ minutes. While this was a shorter time than it should be triturated, it is about the time consumed by most dentists for this operation.

The packing was done with flat ended instruments, using steady but heavy force immediately after mixing. The mass did not lie still a moment. Readings were now taken on six of the tests (three of each alloy) with the fillings and micrometer at room temperature (70° F.).

The other six (three of each alloy) were read with the fillings and micrometer in the thermostat at body temperature (98° F.) and left there for twenty-four hours, after which time the temperature was raised to possible mouth temperature (130° F.) and kept there for nearly two years.

Let us notice that three fillings of each alloy were thus kept at room temperature, and three of each kept at body temperature for twenty-four hours and then at possible mouth temperature (130° F.) for the remainder of the time.

The reason for subjecting the second set of fillings to 98° F. for twenty-four hours was that I wanted to take advantage of the doubt that existed in my mind as to the rapidity with which mercury will diffuse and uniformly distribute itself. This I did by keeping the tests at a low, rather than a high, temperature during the initial setting, the time when the mercury would diffuse most rapidly, because it is not mechanically prevented from diffusion by early crystallization of certain parts of the filling.

Every one of the twelve fillings gave expansion varying from 1-20,000th to 3-20,000th of an inch during the first twenty-four hours. The next thing that I observed was that the tests which were kept at room temperature gave no further expansion after the first ten days and practically none after the first three or four days, while the one kept at possible mouth temperature (130° F.) expanded for nearly two years.

The total amount of expansion from these two alloys was not

so different, though the one which contained 3.50 per cent of zinc cut a little finer and annealed a little more, had the preference, and ceased moving any appreciable amount after the first six months. The one containing only 1.25 per cent of zinc continued to expand much longer than the one containing 3.50 per cent of zinc, I think for no other reason than that it was cut coarsely, which resulted in its being more incompletely amalgamated at the time the test was made, and the simple fact that it did not contain *more* of the constituent which amalgamated easily.

SOME CONCLUSIONS THAT I MUST NECESSARILY DRAW.

1. The best manufacturers are conscientious and justified in making claims of superiority one over the other.

2. Many of the best manufacturers are measuring their alloys by different standards, which often results in one claiming superiority over the other, while the superiority thus claimed was made at the sacrifice of some other property.

3. If a public means for protecting the profession were instituted similar to the one in the medical profession, the results of which are published in the *Journal of the American Medical Association,* these claims of superiority would be well understood.

4. That zinc is not so much of a disturbing element as incomplete amalgamation and imperfect annealing.

5. That temperatures of 130° F. caused by hot foods and drinks, facilitate the diffusion of loosely and uncombined mercury.

6. That alloys made after the plan of the two previously mentioned must be cut finer, regardless of the decrease in strength, and dentists must work them more thoroughly if a *greater* degree of stability to our amalgam fillings is to be obtained.

7. That alloys which are advertised to expand only 1-10,000th of an inch do this during the initial setting, and that this expansion in increased during the final setting.

THE STRENGTH OF OUR ALLOYS VARIES.

I have just discussed how a filling which was advertised to give only a slight expansion could result in an enormously expanded one after some months because of the incomplete union of mercury and alloy, accompanied by increased temperatures in the mouth.

I think you have all observed that many of your fillings have

more than filled the cavity, appeared spheroid, and the borders been raised after a year or two, hence, you can easily comprehend that a change has taken place.

I desire now to call your attention to the same kind of a phenomenon which occurs in the strength of this class of alloys.

Many of you have observed that many old amalgam fillings cut more easily than new ones. Let me now discuss the changes in strength which have occurred up to date in two of our best quick setting alloys. On the 20th of January, 1906, I made two hundred fillings from two of the best alloys I could purchase. They were made in a mold, which held five fillings and worked exactly as I did the tests previously mentioned. Five fillings were thus made at one mix and the mass was kept moving by my assistant while I was packing, not allowing it to lie still a moment before it was packed.

Six of these fillings were broken at a time with the dynamometer, at varying intervals, from that time up to the present time. An average of the six fillings thus broken was taken as the crushing resistance of the alloy at that time.

Alloy No. 2—	Per cent.	Alloy No. 1—	Per cent.
Silver	65.50	Silver	68.00
Tin	25.50	Tin	26.50
Zinc	3.00	Copper	4.20
Copper	6.00	Zinc	1.30

Age of Alloy.	Crushing Resistance. Alloy No. 1,	Crushing Resistance. Alloy No. 2,
1 day	435 lbs.	452 lbs.
2 days	478 lbs.	462 lbs.
4 days	485 lbs.	453 lbs.
24 days	493 lbs.	447 lbs.
42 days	497 lbs.	447 lbs.
85 days	475 lbs.	433 lbs.
205 days	414 lbs.	367 lbs.
341 days	344 lbs.	310 lbs.

First, let us notice that the alloy containing the higher percentage of silver did not reach its maximum strength until some time after the one containing the higher percentage of zinc, though it was higher when once reached.

We will now recall the fact that in the test previously given for permanency of form, the alloy containing the higher percentage of zinc stopped expanding some time before the one containing the lower percentage. A similar phenomenon occurred here, the one containing the higher percentage of zinc reaching its maximum strength first.

These two tests illustrate, as do a multitude of others that I have made, that the time when the maximum strength of an alloy is reached depends entirely upon the ease with which it amalgamates, and this, obviously, depends upon the composition of the alloy.

We will further notice that the filling is strongest when only a part of the filings are dissolved in the mercury. Rarely, indeed, do we get much strength to a filling made from this class of alloys within the first twenty-four hours and usually forty-eight hours lapses before the maximum strength is even approximated.

As we have just noticed, it may be a month or two after which time the strength begins to lessen. We can imagine, from our present knowledge of the effect of mercury on its alloys, that such a change would take place in the strength of our alloys.

If we could limit the action of mercury to the surface of each little particle of alloy we would thereby obtain a filling composed of little particles of alloy held together by a cementing substance.

Since the filings of the alloy are much stronger than "the filings of alloy and mercury combined," to make a cementing substance, we would by thus limiting the action of mercury to the surfaces of the filings, obtain a much stronger filling, and at the same time make another great stride by obtaining a filling more permanent in form.

COPPER ALLOYS.

The copper alloys furnish us very striking examples of what may be accomplished in permanency of form by either completely uniting the mercury with the filing or by limiting the action of the mercury to the surface of the filing.

How many of you ever saw a copper amalgam filling that had expanded or was in any way distorted? Certainly, none of you, because in one method of preparing the alloy the copper is completely united with the mercury, while with the other method of preparing, the mercury is limited to the surface of the filings.

You have all seen copper amalgam fillings that had apparently washed or dissolved away. This is a common occurrence because copper, while it retains its luster very well in the dry air, is quickly covered with a green layer of basic carbonate in moist air, and becomes blackened by contact with sulphureted hydrogen.

Either the carbonate or sulphide would be dissolved or worn away only to leave a new surface to be attacked again. A continuation of

this process gives us what is commonly called "cupping-out" of copper amalgam fillings.

From this little diversion let us return to the permanency of form of copper amalgam fillings. If we try to unite copper and mercury directly at any temperature possible in the mouth, we meet with failure. They do not unite. However, copper does unite with mercury at these temperatures when aided by the electric current or acidulated solutions.

The maker of these alloys may unite them by either means he chooses, and all that is required of the dentist is to heat the alloy and insert it, after which it slowly recrystallizes.

If he has completely amalgamated the two in definite chemical proportions to form the compound (Cu Hg) there is no expanding, spheroiding, etc.. after the mass has been placed in the cavity. These bulk changes, if there were any, took place at the time of amalgamation, leaving us only the co-efficient of expansion to contend with. Since only a low temperature is required to soften the mass, we practically eliminate bulk changes.

If, on the other hand, the copper amalgam is prepared by triturating copper filings with mercury, and a little mercuric nitrate, only the surfaces of the filings will be attacked.

We have then undissolved filings held together by a cementing substance, a mass which is physically quite analogous to the one so often made from our high grade alloys composed of silver, tin, copper and zinc, though it is more stable in form, because the undissolved portions of filings are insoluble in mercury alone.

It is not my intention to decry the high percentage silver alloys, and laud the copper alloys, but, rather, to show the necessity for a more complete union of the filings and mercury at the time of inserting the filling. Since with our high grade alloys, as they are now made, the only alternative is to strive for a more complete union.

It is out of all reason to insert copper amalgam fillings in anything but the most desperate cases, when we have the variety of other materials that modern dentistry affords. Nevertheless they furnish a most striking examples of permanency of form.

Some conclusions:

1. That the strength of alloy varies with age.

2. That they also vary with the amount of alloy dissolved in the mercury at the time of making a filling.

3. That their crushing resistance is *very low* for the first few hours after being made, and is often so for a day or two.

4. That the period of greatest crushing resistance does not last but a month or two.

5. That the decline in the crushing resistance is simultaneous with and dependent upon a continuation of the amalgamation process after the filling has been made.

6. That regardless of this decline in crushing resistance, we should work such alloys more thoroughly, because they are not only more permanent in form, but sufficiently strong for practical purposes.

PLASTIC ALLOYS.

One of the great drawbacks to the success of the hard alloys is that a majority have never mastered their working properties.

Scores have tried them faithfully and conscientiously and have done good service with them, while scores of others have catered to their personal likings and demanded easier working, slower setting alloys. Naturally the manufacturers have responded promptly.

In looking over some of the leading manufacturers' products today we find that almost every one of them is making at least one high per cent silver alloy and one plastic alloy, for example:

Manufacturer—	*Name of High Percentage of Silver Alloy.*	*Name of Low Percentage of Silver Alloy.*
L. D. Caulk & Co.	20th Century	Par Excellence.
Dental Protective Supply	Fellowship	Ductile
H. D. Justi & Sons	Triumph	White Alloy.
Frink & Young Co	Permaneo	Standard.
Garhardt Dental Mfg. Co	Acme	Standard White.
Ransom & Randolph Co	Micrometric	Success.
Gideon Sibley	Rego	Sibley's G. & P.
Consolidated Dental Co	Superior	Crescent.
S. S. White Mfg. Co	True Dentalloy	Globe.

And so it goes all through the list of dental manufacturers' products.

The most of the so-called plastic alloys make the most unstable fillings that can be placed in the mouth. They are positively the worst. Their composition is based on the dual movement, 50 per cent of silver and 50 per cent of tin.

To avoid the slight shrinkage which occurs in the early stages of setting most of the manufacturers have added about 1.50 per cent or 2 per cent of zinc. They have been successful in this respect, though their crushing resistance is low, they flow badly and are cut coarsely.

A coarsely cut alloy composed of about 1.50 per cent of zinc and the remainder equally divided between silver and tin, is free from shrinkage, retains a good color, and works easily, but is capable of more expansion in the mouth than anything I know of.

Let me suggest a test which any of you can try. Prepare a cavity in a fairly strong extracted tooth and fill it with one of the plastic alloys. Let it set twenty-four hours, after which polish the edges smooth and make the center of the filling level with the borders, so that you can detect the spheroiding caused by the expansion of the alloy. Place it near a heater, where the heat approximates 130° F., and leave it there a week or two. If you are fortunate enough to have some test tubes, a micrometer and a thermostat, by all means use them.

First notice that the tooth is sufficiently strong to resist the expansion of the alloy, and as a result you get a spheroided filling, caused by the lateral and downward expansion meeting with resistance in the walls of the cavity, thus directing these forces toward the center.

Let the filling remain near the heat as long as you get an expansion, and see if you are not surprised at the amount. It is not my intention to cast aspersions at the makers of this class of alloys, since almost every one of them have a better alloy which he is perfectly willing and anxious to sell. It is, however, a reflection upon the man who uses them, and any one of you can by a little observation detect them in a short time.

DIFFERENT METHODS OF DETERMINING SHRINKAGE AND EXPANSION.

Another thing of which I wish to speak is the proper method of measuring shrinkage and expansion. When prominent men write articles for our foremost journals, in which they state that such alloys as 20th Century, Fellowship, Acme and True Dentalloy shrink, I think it is time for disinterested parties to explain *why* such results were obtained.

When Townsend's alloy, which at the time the article was printed, April, 1905, was composed of 42.02 per cent of silver, 57.56 per cent of tin and .42 per cent of copper, is claimed to be free from shrinkage, and the above named alloys are said to shrink, I am sure that it is another case of measuring a product by different standards.

When it is claimed, not only by the writer of this article, but

by others, some of which are here in your city, that the specific gravity method is the right one, and that the products of some of our very best manufacturers shrink, we must all "take notice," since I am just describing to you how the most of these alloys expand indefinitely.

Even the most casual observer must be impressed with the injustice of such contradictory articles, which serve only to confuse the general practitioner.

The writer of the article previously mentioned found these alloys to shrink when tested by the specific gravity method, while I have every reason to believe that the makers of these alloys tested them with the micrometer and found them to expand. The general practitioner asks, "Which one is right?"

I am willing to admit that the micrometer gives only linear measurement, and that excessive expansions may be obtained by converting lateral expansions into a flow of the metal upward by making the tests in sufficient resistant receptacles, and, further, that the specific gravity method of determining shrinkage and expansion is the one generally adopted by physicists.

However, I am not ready to admit that the micrometer is not the proper device for measuring the shrinkage and expansion of dental amalgam alloys. Let me call your attention, if you have not already noticed it, to the fact that shrinkage may be either a change in volume or a change in dimensions, and that the two are distinctly separate in some parts of this work. In other words, the volume of a body may be either "real" or "apparent," the real volume being the space occupied by the actual substance of which the body is composed after making all allowance for the pores or interstices that may be present on the surface of the body, while the apparent volume is the space included within an imaginary surface which just takes in the body interstices and all.

If we determine the amount of water displaced by a certain piece of material we say "we have determined its volume." If we cut some holes in the surface of this "same piece of material" and then immerse it in water, we find that it displaces much less water than it did before, naturally we say its volume is less, but we have not changed its dimensions one iota.

When an amalgam filling is packed in a cavity or other recep-

tacle the surfaces are smooth and glistening with mercury, which has been forced there by pressure applied to the center of the filling. All pores or interstices which may be present on the surface between pieces of undissolved alloy are filled with mercury, making the surface bright and smooth.

If we examine these surfaces a few hours later we find the same places which were particularly smooth and bright now roughened and covered with pores and interstices. This is seen with the naked eye when working with coarsely cut, imperfectly annealed high per cent silver alloys, which dissolve so slowly that there is but little alloy dissolved in the mercury at the time of mixing.

It is quite evident that if an amalgam filling made from 20th Century, Fellowship, Acme and True Dentalloy, or any others of this class, were subjected to a specific gravity test, they would show a decrease in volume, especially if they were amalgamated about half enough, thus leaving large particles of alloy undissolved. This test would measure the pores and interstices formed on the surface during the first few hours, caused by absorption to the center and dryer parts of the filling of the mercury which filled these pores during the first few hours.

On the other hand, if these same alloys were worked thoroughly and measured with a micrometer, they would show an increase in the dimensions. I therefore find it true in my work that a given alloy which shows a slight expansion in the early stages of the setting when measured with the micrometer will give a slight shrinkage if measured by the specific gravity method. In other words, the dimensions may increase and the volume decrease at the same time.

From what has been said it may be seen that those who use a micrometer regard shrinkage as a decrease in magnitude measured along a diameter, while those who use the specific gravity method regard shrinkage as a decrease in volume, which includes the pores and interstices formed along such a diameter. In other words, the men who use the specific gravity method are measuring the mercury which is being taken from the surface to the center and dryer part of the filling forming the air spaces on the surface out of what was a few hours before filled with mercury.

In conclusion let me briefly speak of the air spaces spoken of and shown you by Dr. Callahan, of Cincinnati, at your March meet-

ing. He showed you that these spaces were not only on the surface but along the margin of your fillings. You observed them on the screen. You talked about them in your discussion, they are certainly there. Dr. Black stated that "the best method of making amalgam fillings tight is to use all the force you can and pack it along the walls with a very small instrument," and "if we could work amalgam as well to the walls of our cavities as we can gold, it would stand as well," that "fillings may contains as much as 12 per cent of air." The statement of Dr. Black that we should use plenty of force and pack the alloy along the walls with small instruments is certainly one to be considered.

The one made by Dr. Callahan with regard to the rotary burnisher is not to be ignored, since it, too, gives a thoroughly packed filling, though I would add to both statements that the air must be well removed from the mass by thoroughly working it.

The statement of Dr. Black that "if we could work amalgam as well to the walls of our cavities as we can gold it would stand as well" represents in a general way the feeling of the whole profession today. A large per cent of the men of the profession feel that their successes are due to their getting the filling well packed and their failure due to the lack of adaptation.

There is no doubt but that this is true in many cases, though I most firmly believe that it is not quite the root of the evil, nor the real reason why amalgam is a poorer filling material than gold, for the following reasons:

1. Our present amalgams will not lie still after they have been inserted in the cavity and the borders finished. There is absolutely no reason why they should when the alloy is but partially united with the mercury at the time of mixing and mouth temperature is sufficient to allow the union to be completed, remembering, of course, that all chemical actions are either retarded or accelerated by changes in temperature.

Gold does lie still after being placed in the cavity. There is no mercury or other substance to unite with it. It simply welds in the cold.

2. Amalgam fillings are both oxidized and sulphidized in the mouth. These oxides and sulphides are dissolved or worn away, causing a loss in material. When this loss of material occurs at the

border of the filling it no longer fills the cavity and often presents a very ragged edge. Gold is not oxidized and sulphidized in the mouth. Its borders are immune to the attack of almost everything. I have called your attention to a few of the more glaring misunderstandings and trust that this society will use its every influence to bring about a means of settling them and protecting the profession against the use of poor alloys.—*Review.*

THE QUESTION OF EXTRACTION IN ORTHODONTIA.

BY WILLIAM J. BRADY, D.D.S.

During the last ten years the subject of orthodontia has undergone the greatest change in practice and in the opinions thereon of any branch in the whole domain of dentistry, and incidentally more real progress has been made in the same than in all the centuries preceding. For the first time orthodontia has been investigated sufficiently to get at the facts concerning the causes of malocclusion and the real principles governing the treatment thereof. As might be expected, when foundation facts are once reached much previous theorizing has been undone and many speculative structures have been left with nothing on which to stand.

It has been shown that much of the practice of the past has been founded on poor principles, or rather, no principles at all, and that to secure permanent and satisfactory results many things must be done exactly the opposite of what was once taught and what is still widely believed. The practice of extraction in orthodontia is one of the things on which ideas have been exactly reversed by all those who have progressed far enough to understand how the mechanism of mastication really operates and how the development of the facial structures depends on the normal use of the teeth. The stand taken by the believers in modern practice is so different from the old and is maintained so vigorously that it deserves more than passing notice, especially when there is so much proof available on every hand of the correctness of the position.

While the suspicion of a fad may always be entertained about any radical idea, yet it should not be taken for granted that a new idea is

wrong simply because it is radical when compared with what is usually believed. The usual and the old-established are not invariably right, not by any means. Some of the most egregious blunders and most absurd ideas have passed for centuries as the eternal and everlasting truth. And usually when the truth arrived, and was announced, and was demonstrated, and was proven again and again without doubt, it still was not accepted without misgivings and delay, all because "we had been taught otherwise by the fathers."

The announcement of the incorrectness of extraction in orthodontia has been received in much this way. It has been pronounced a fed, a one-man idea, a freak notion and a wholly wrong proposition, radical and not proven. But just the same it has been preached and practiced, and so many have not only found the doctrine good, but have *proven* it good, that it will not down nor be hid under a bushel. Extraction in orthodontia is undoubtedly wrong, and has been wrong all these years that it has been taught and practiced. And these statements are not based on mere opinion, but are susceptible of proof that ought to be convincing to any reasonable man, so convincing that he should not hesitate to accept the new and abandon the old without further ado.

It may require an absolute backdown to do this, and there's the rub with many. After having advocated extraction in many instances, mayhap in a dental journal or even in a book, it requires quite a stiffly starched spinal column to be equal to an absolute reversal of practice and opinion. But what is a backdown compared to being right? "The wise man changes his opinions, the fool never." The true philosopher profits by the truth, wherever it comes from.

The men who advocate non-extraction in orthodontia did not come to that conclusion from traveling along a rose-strewn and perfumed path; neither was this wisdom gained by any special dispensation of Providence. Not exactly. The truth was finally forced upon them through the hardest of hard knocks; through dismal failures that made the heart sick, that lost business and made enemies, that shook the confidence of friends and colleagues. Dr. Edward H. Angle is one of the chief and foremost advocates of non-extraction, and no man ever traveled over a rockier road to gain this knowledge than did he. Others have experienced a few pile-driver jolts also, and the most earnest believers in non-extraction are those who have had the most

trouble from extraction. The difference between them and other men is that they have perceived the cause of their trouble and have profited by their bumps.

Extraction for the so-called correction of irregularity is a snare and a delusion. It has done far more harm than good in the past, and will continue to do so as long as employed. We do not include such work as extraction of supernumerary teeth in this category, but we do include all other kinds, especially extraction to "make room" for teeth. Such extraction invariably lessens the room instead of creating more; the dental arch collapses still more than its original condition and the remaining teeth are worse crowded than before. This may not be apparent at first, but may be easily proven. Heaven knows, there are altogether too much proof of it already existing, due to the efforts of well-meaning but much-mistaken doctors and dentists.

Extraction destroys the correct occlusion of the teeth, the fact on which permanency of form of the dental arch depends. There is no time in life but what the teeth will move from their positions and change the form of the dental arch if said arch is not rigidly maintained intact. The dental arch follows the same laws of mechanics as any other arch; if one or more of the stones be lost from over a vaulted doorway or window, that arch will collapse, and there is no getting away from the fact. Extraction performs exactly the same office for the dental arch, and slowly but surely collapse of the dental structure follows. Nature does her best to correct the difficulty and patches up the best occlusion possible from the wreck, but it is never a good one and often not even a serviceable one.

Right here somebody always rises to say, "But what if the occlusion is not quite perfect? I haxe extracted in many cases, and the teeth finally shifted around till my patient looked better, and the occlusion was good enough for all practical purposes." This statement *sounds* well enough, but, Mr. Man, have you ever *really* investigated the conditions in one of these cases? Have you made models of the case year after year and noticed the change of form of the arch, and watched the gradual drift of teeth about, and studied to see how some received practically all the wear and others none, and then noted how first one tooth and then another was lost years before its time? Have you mounted models of the case in an anatomical articulator (not an old barn-door hinge) and tested the occlusion—not just the

open-and-shut motion, but the incising and lateral motions as well—and noted that the shearing action was all but lost where your extraction occurred; that often the teeth on a whole side were not in contact at all upon the slightest sidewise motion, and that your seeming good occlusion was in reality no occlusion at all; all this and plenty more besides? No, my dear boy, you have not made these tests or you would now be against extraction with all your might, for you would see its evil effects beyond mistake and you would *know* that extraction was wrong, the same as the rest of us have learned from these very same things and many more like them.

No one need doubt in the matter of extraction, nor take anyone's word in the case, for anyone who cares may easily test it himself, and that, too, without doing harm. Mount a set of *good* models, in any case where extraction has occurred in an anatomical articulator and begin. Don't use the common articulator, for it is absolutely valueless is studying occlusion, or for any other purpose, for that matter. The mere striking together of the upper and the lower teeth does not constitute occlusion, not by a thousand miles. The operation of mastication involves the gliding and sliding of all the teeth over each other during all motions of the jaw, and occlusion includes every variety of contact possible between the upper and lower teeth, both while in motion and while at rest. It takes a real articulator to represent this; the fake variety doesn't fill the bill.

It will be found that though there may be apparently good contact between uppers and lowers when in a state of rest, the moment the lower jaw is moved laterally there is failure to occlude properly in some particular, and usually in many particulars. And it is the proper interlocking and shearing during the *lateral motion* that holds the teeth firmly to their places, as well as performs the major part of mastication, two of the important factors connected with occlusion.

The experiment may easily be tried of extracting a tooth or two and then rearranging the teeth in a new occlusion. Mount up a set of models, more or less irregularly, but containing all the teeth, then saw off and lay aside a plaster tooth, say a first bicuspid, as is often sacrificed in the vain effort to correct through extraction. Then saw off a few of the others, as many as thought necessary, and wax them fast in new positions, moving them only such amounts and giving them such positions as can reasonably be expected through regulat-

ing. It will be found that it is a hard job to make any arrangement whatever whereby even a semblance to occlusion is gained, and utterly impossible to make an occlusion that performs any service upon the lateral motion. Such an occlusion would not hold the teeth in place, and such a case would not stay corrected when done. The experiment may be varied at will, leaving out first one tooth and then another, or "extracting" one from both upper and lower arches, or any other combination that is usually tried; but each and all will fail when the test of lateral motion is applied, and each would fail to be permanent if performed in actual practice.

There is neither mystery nor theory in the doctrine that extraction in orthodontia is wrong. Anyone may understand it and demonstrate it for himself. Its bad results have been demonstrated practically, alas! time and time again, and, it must be regretfully stated, it will be practiced yet other times by those who ought to know better. In years gone by people believed the world was flat—were certain of it—till one fine day a man completed a voyage entirely around it. All the previous philosophy and teaching concerning the world's flatness went out of date in an instant, yet they could not give up the good old beliefs for a long time after. The question of extraction in orthodontia is exactly similar; it has been proven wrong. Don't be one of those who still believe the earth is flat.—*Western Dental Journal.*

MEETINGS

NATIONAL SOCIETY MEETINGS.

National Association of Dental Examiners, Minneapolis, Minn., July 26, 27, 28.

National Dental Association, Minneapolis, Minn., July 30.

Institute of Dental Pedagogics, New Orleans, December 30 to January 2, 1908.

STATE SOCIETY MEETINGS.

Alabama Dental Association, Birmingham, May 14, 15, 16, 17.

Arkansas State Dental Association, Eureka Springs, May 29, 30, 31.

Connecticut State Dental Association, New London, April 16, 17.

Georgia State Dental Society, Atlanta, May 7, 8, 9, 10.

Illinois State Dental Society, Quincy, May 14, 15, 16, 17.

Indiana State Dental Association, Indianapolis, June 11, 12, 13.

Iowa State Dental Society, Cedar Rapids, May 7, 8, 9.

Maine Dental Society, July 16.

Michigan State Dental Association, Saginaw, June 4, 5.

Minnesota State Dental Association, Minneapolis, July 30, Aug. 3.

Mississippi State Dental Association, Meridian, May 28, 29, 30.

Nebraska State Dental Society, Lincoln, May 21, 22, 23.

New Jersey State Dental Society, Asbury Park, July 17, 18, 19.

New York State Dental Society, Albany, May 10, 11.

Vermont State Dental Society, Burlington, May 15.

Virginia State Dental Association, Jamestown, Sept. 10, 11, 12.

Wisconsin State Dental Society, La Crosse, July 16, 17, 18.

INSTITUTE OF DENTAL PEDAGOGICS.

The executive committee selected New Orleans for the fifteenth annual convention, and December 30, 1907, and January 1 and 2, 1908, the dates.

ARKANSAS STATE BOARD.

The Arkansas State Board of Dental Examiners will hold examinations at Eureka Springs, May 27, 28, 1907. A. T. McMillin, secretary, Little Rock. The Arkansas State Dental Association will

hold its annual meeting at Eureka Springs, May 29, 30, 31, 1907. Henry P. Hopkins, secretary and treasurer.

MICHIGAN STATE DENTAL ASSOCIATION.

The Michigan Dental Association will meet at Saginaw, June 4 and 5. All ethical practitioners cordially invited.

L. N. HOGARTH, Secretary.

ARKANSAS STATE BOARD.

The Arkansas State Board of Dental Examiners will hold examinations at Eureka Springs, May 27, 28, 1907. A. T. McMillin, secretary, Little Rock. The Arkansas State Dental Association will hold its annual meeting at Eureka Springs, May 29, 30, 31, 1907. Henry P. Hopkins, secretary and treasurer.

MINNESOTA STATE BOARD.

The State Board of Dental Examiners of Minnesota will hold a special meeting at the Dental Building of the State University in Minneapolis on June 6, 7 and 8, 1907. All applications must be in the hands of the secretary by 10 o'clock June 6, as examinations will begin at 10:30 o'clock sharp. All blanks, paper and patients supplied by this board. Operating instruments, etc., must be brought by the applicant. Any further information will be given by addressing Geo. S. Todd, Secretary, Lake City, Minn.

WISCONSIN STATE BOARD OF DENTAL EXAMINERS.

The next meeting of the Wisconsin State Board of Dental Examiners for examination of candidates for licenses to practice dentistry in Wisconsin will be held Monday, June 10, 1907, at the Wisconsin College of Physicians & Surgeons,, Milwaukee, Wis.

Application must be made to the secretary fifteen days before examination. The candidate must be a graduate of a reputable dental college, or have been engaged in the reputable practice of dentistry for four consecutive years, or an apprentice to a reputable dentist for five years.

For further particulars apply to J. J. Wright, Secretary, 1218 Wells Bldg., Milwaukee, Wis.

EASTERN INDIANA DENTAL ASSOCIATION.

The Eastern Indiana Dental Association meets in Anderson, Indiana, May 14 and 14. Good clinics. Good papers. Everybody invited. Everybody who comes is a member. Yours truly,

C. W. ORLAND.

INDIANA STATE DENTAL BOARD.

The next regular meeting of the Indiana State Board of Dental Examiners will be held in the Capitol at Indianapolis, June 11, 12, 13, 1907. All applicants for examination to practice in the state should apply to the secretary for further information, blanks, etc. Applications for examination must be in the hands of the secretary at least five days before the above date.

F. R. HENSHAW, Secretary.

Middletown, Indiana.

MISSISSIPPI DENTAL ASSOCIATION.

The fourteenth annual meeting of the Mississippi Dental Association will meet in the County Court House in Meridian, May 28, 29, 30. All ethical practitioners of this and other states are cordially invited to attend.

Reduced railroad rates and reduced hotel accommodations will be secured.

For full particulars address

E. DOUGLAS HOOD, Secretary,

Tupelo, Miss. Mississippi Dental Association.

IOWA STATE BOARD OF DENTAL EXAMINERS.

The Iowa State Board of Dental Examiners will hold its next meeting for examination at Iowa City, June 6, 7, 8, 10, 11, 1907.

To be eligible to this examination the applicant must hold a diploma from a college that is on the accredited list of the National Association of Dental Examiners.

Applicant must state where he attended first, second and third year of college.

Address all communications to

E. D. BROWER, D. D. S., Secretary.

Le Mars, Iowa.

IOWA STATE DENTAL SOCIETY.

The forty-fifth annual meeting of the Iowa State Dental Society will be held at Cedar Rapids, Iowa, May 7, 8, 9, 1907. A good program is being arranged for. A cordial invitation is extended to the profession. C. L. TOPLIFF, Secretary.

Decorah, Iowa.

INDIANA STATE DENTAL ASSOCIATION.

The forty-ninth annual meeting of the Indiana State Dental Association will be held at the Claypool Hotel, Indianapolis, June 11, 12, 13, 1907. The executive committee has arranged an unusually interesting program for this meeting. A cordial invitation is extended to the profession to be present.

CARL D. LUCAS, Secretary,

Indianapolis.

ILLINOIS STATE BOARD OF DENTAL EXAMINERS.

The next regular meeting of the Illinois State Board of Dental Examiners for the examination of applicants for a license to practice dentistry in the state of Illinois will be held in Chicago, at the Northwestern University Dental School, southeast corner of Lake and Dearborn streets, beginning Monday, June 3, 1907, at 9 a. m.

Applicants must be in possession of the following requirements in order to be eligible to take the examination: (1) Any person who has been engaged in the actual, legal and lawful practice of dentistry or dental surgery in some other state or country for five consecutive years just prior to application; or (2) is a graduate of and has a diploma from the faculty of a reputable dental college, school, or dental department of a reputable university; or (3) is a graduate of and has a diploma from the faculty of a reputable medical college or medical department of a reputable university, and possesses the necessary qualifications prescribed by the board.

Candidates will be furnished with proper blanks and such other information as is necessary on application to the secretary. All applications must be filed with the secretary five days prior to the date of examination. The examination fee is twenty ($20) dollars with the additional fee of five ($5) dollars for a license.

Address all communications to

J. G. REID, D. D. S., Secretary.

1204 Trude Building, 67 Wabash Avenue, Chicago, Ill.

JAMESTOWN EXPOSITION, NORFOLK, VIRGINIA, 1907.

The Jamestown Dental Convention, Norfolk, Virginia, September 10—12, 1907.

COMMITTEE ON ORGANIZATION.

Burton Lee Thorpe, Chairman, St. Louis, Mo.
H. Wood Campbell, Secretary, Suffolk, Va.
F. W. Stiff, Treasurer, Richmond, Va.
R. H. Walker, Norfolk, Va.
Thos. P. Hinman, Atlanta, Ga.
Clarence J. Grieves, Baltimore, Md.
J. E. Chace, Ocala, Fla.

The Jamestown Dental Convention will be held in an especially equipped building on the Exposition Grounds, which was built for the purpose of accommodating this convention, the building is equipped with an auditorium, committee rooms, and excellent facilities for conducting dental clinics and for holding exhibits. All of these will be held in this building. The entrance to the building is outside of the grounds, however, one may obtain access to the grounds through it. The building is wired with both direct and alternating current, equipped with running water, well lighted and contains all modern conveniences, thus making it an ideal convention hall. The exhibits are under the management of Dr. John W. Manning, Bank of Commerce building, Norfolk, Virginia. To him exhibitors should apply at once for space. Price per foot and a plat of the hall will be sent upon request. The clinics are under the supervision and direct control of Dr. C. J. Grieves, Park and Madison avenues, Baltimore, Md. His assistants are, Drs. Baskerville Bridgeforth, Richmond, Virginia; E. J. Tucker, Roxboro, N. C.; Herbert Johnson, Macon, Ga.; F. A. Bowles, Washington, D. C., and Joseph T. Meadors, Nashville, Tenn. The prospects are that the Jamestown clinic will be the largest and most complete dental clinic ever held. Assistants clinic chairmen have been appointed in each state in the Union and nearby countries, viz.: Canada, Mexico, Cuba and Hawaii. From these come reports of the enlistment of the best clinic talent in their respective states and countries.

Membership chairmen have been appointed in the various

states and countries. Names of these and the clinic chairmen will appear with the list of other officers in this issue of this journal. The membership committee is headed by Dr. F. W. Stiff, the general chairman, 600 East Grace street, Richmond, Va., who already reports memberships repidly coming in. The hotel headquarters will be at the Inside Inn, where reasonable rates and excellent accommodations are assured. The Inside Inn generously offers numerous halls and committee rooms free of charge to the various college fraternities and alumni, who are invited to hold their meetings in these rooms. Later reports as to hotel accommodations and prices will appear in a subsequent issue of this journal. The membership fee is five dollars, which will entitle members to a bound copy of the proceedings. A half rate $2.50 is made to bona fide dental students upon certificates from the Deans of their colleges, and when presented to the state chairman of the membership committee, for endorsement and acceptance, will entitle them to the rights and privileges of the convention. The essayists are to be Prof. W. D. Miller, of Berlin, Germany; Dr. F. T. Van Woert, Brooklyn, N. Y., whose subject is, "Is the Cemented Filling the Filling of the Future?" Dr. Chas. L. Alexander, of Charlotte, N. C., who will present a paper on "Gold Inlay." The other essayists will be announced later. Dr. E. P. Beadles was elected by the Committee on Organization, in February, to go to Europe and extend a cordial invitation to the dental societies and individual dentists to attend the convention. The following officers were elected by the committee on organization at its recent meeting, February 23, 1907:

Honorary President—Dr. J. Y. Crawford, Nashville, Tenn.
President—Dr. V. E. Turner, Raleigh, N. C.
First Vice-President—Dr. B. Holly Smith, Baltimore, Md.
Secretary—General—Dr. Geo. F. Keesee, Richmond, Va.
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Dr. J. R. Osborne, Shelby, N. C.

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Dr. Max M. Eble, Louisville, Ky.
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Dr. G. V. Black, Chicago, Ill.
Dr. T. W. Brophy, Chicago, Ill.
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Dr. Alton H. Thompson, Topeka, Kas.
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Dr. Geo. L. Field, Detroit, Mich.
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Dr. F. A. Shotwell, Rogersville, Tenn.
Dr. D. J. McMillen, Gadsden, Ala.
Dr. George S. Vann, Gadsden, Ala.
Dr. Chas. S. Butler, Buffalo, N. Y.
Dr. A. S. Melendy, Knoxville, Tenn.
Dr. W. D. Miller, Berlin, Germany.
Dr. Chas. L. Alexander, Charlotte, N. C.
Dr. F. T. Van Woert, Brooklyn, N. Y.
Dr. Edwin C. Blasdell, Portsmouth, N. H.
Dr. Chas. A. Meeker, Newark, N. J.
Dr. R. M. Sanger, Orange, N. J.
Dr. H. J. Burkhart, Batavia, N. Y.
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Dr. Geo. H. Wilson, Cleveland, Ohio.
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Dr. John W. David, Corsicana, Texas.
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Dr. G. V. I. Brown, Milwaukee, Wis.
Dr. W. A. Cudworth, Milwaukee, Wis.
Dr. A. J. Derby, Hawaii, Honolulu.
Dr. Andres C. Weber, Havana, Cuba, Corelas 1 Esq-aEgido.
Dr. J. Falero, 18 Tacuba, City of Mexico, Mexico.
Dr. Ricardo Figueroa, 1 Call de Santo Domingo No. 8, City of Mexico, Mexico.

GENERAL CLINIC COMMITTEE.

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Pennsylvania—Howard E. Roberts, 1517 Locust street, Philadelphia.
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Tennessee—Justin D. Towner, Memphis.
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Vermont—K. L. Cleaves, Montpelier.
Virginia—Wm. Pilcher, Petersburg.
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Wisconsin—W. H. Mueller, Madison.
Canada—Theodore C. Trigger, St. Thomas, Ontario.

Mexico—Ricardo Figueroa, 1 Calle de Santo Domingo No. 8, City of Mexico.

Hawaii—E. L. Hutchinson, Honolulu.

West Virginia—Chas. H. Bartlett, Parkersburg.

FULL LIST OF ESSAYISTS FOR THE JAMESTOWN DENTAL CONVENTION.

Prof. W. D. Miller of Berlin, Germany, subject, "Demonstrations of Preparation Relating to the Wasting (so-called Erosion) of the Teeth"; Dr. Chas. L. Alexander, Charlotte, N. C., subject, "Gold Inlays"; Dr. F. T. Van Woert, Brooklyn, N. Y., subject, "Is the Cemented Filling the Filling of the Future?" Dr. R. Ottolengui, New York City, N. Y., subject, "The Angle Method in Orthodontia."

OBITUARY.

Dr. Walter Augustus Stevens, dentist, a resident in Chicago for forty-six years, died April 15 at his home, 2631 Wabash avenue. Dr. Stevens had been ill for a year from a hip fracture. He was born in Honeoye, N. Y., April 19, 1830; attended the Ontario County district schools, and was graduated from the high school at Palmyra, N. Y., and the Genesee Wesleyan Seminary, Lima, N. Y. The faculty of Rush Medical College gave him an honorary degree of doctor of medicine February 15, 1887, because of his work in dentistry. Dr. Stevens was a member of the Odontographic Dental Society, a life member of the Illinois State Dental Society, of which he served as treasurer from 1890 to 1895, and was elected president at Springfield, Ill., May 18, 1895. He was a 33d degree Mason and a founder and charter member of the Miriam Family, which later became the Order of Eastern Star. He was a past master of Blair Lodge No. 393, A. F. and A. M., and at the time of his death was the oldest past commander of Apollo Commandery No. 1, Knights Templar, of which he was made eminent commander in 1874. He was commander in chief of the grand consistory of the State of Illinois, A. R. S., until 1867, and was for eleven years district deputy grand master of the first district A. F. and A. M. of Illinois. He was made an active member of the supreme council of sovereign grand inspectors general of the northern Masonic jurisdiction April 27, 1867. Dr. Stevens is survived by his widow, a daughter, Genevieve I., and a son, Dr. Wirt A. Stevens.

MISCELLANEOUS

TIGHTENING SCREW CONNECTIONS.

For tightening screw connections, dissolve powdered shellac in 10 per cent. ammonia and paint the mass over the screw threads after they have been thoroughly cleaned; then screw the fitting home. The joint will be impervious to hot or cold water.—*Popular Magazine.*

A GOLD INLAY.

The following method of making a gold inlay in the occlusal surface of a molar was recently demonstrated by Dr. W. O. Fillman. After placing matrix of gold roughly, he packed it full of moss-fibre gold, and, removing the mass, flowed solder over the gold. He then replaced the inlay, readapted to the margins with burnishers, and flowed on solder to proper contour. With due care investment is unnecessary.—*Northwestern Dental Journal.*

A HICKORY SPATULA.

The glaze of a glass cement slab being removed, giving a slightly roughened surface, the fine fiber of a hickory spatula permits a millstone grind to the mixture of powder and liquid, insuring the breaking apart and turning over and around of all cement particles, giving a more even mixture and securing a more perfect chemical union, with no discoloration.—*D. R. Phillips, Northwestern Dental Journal.*

CHARACTER.

The man of character can stand serene and strong even when all the accidents such as money, position and fame are swept away. He has a treasure which can never be lost.—*W. T. Chambers, D. D. S., Dental Summary.*

THE HORNS OF THE DILEMMA.

According to Miller, the bacteria increase more rapidly in alkaline than in acid solution; in an acid mouth the acid will cause tooth decay; in an alkaline mouth the bacteria will grow more rapidly, finally generating an excess of acid that will attack the teeth—*Joseph Head, Dental Cosmos.*

TO REMOVE TIN FROM VULCANITE.

Small particles of tin adhering to vulcanite plates can easily be removed by mixing mercury with enough alloy so it will not flow and rubbing it over the plate under fingers.—*C. W. Siefkill, Dental Brief.*

SHRINKAGE IN RUBBER DURING VULCANIZING.

The amount of shrinkage depends not alone on the time the rubber is subjected to the process of vulcanization, but also upon the temperature. The lower the temperature and steam pressure, the less the loss in shrinkage and the less the contraction in cooling. Low heat and long time also insures an improvement in the texture of the product.—*George B. Snow, Dental Brief.*

SPENCE METAL.

Spence metal is composed of sixty parts of sulphide of iron and forty parts of sulphur; the fusing point is 225° F. It is of great value when used as an articulating model, by minimizing the attrition of the antagonistic surfaces, which results when teeth of porcelain are brought into repeated contact with teeth of a plaster model. —*International Dental Journal.*

TOO MUCH RUBBER.

With a good model and good under cuts it frequently happens that the plate does not stick. In 90 per cent of the cases it is because too much pressure is used in closing the flask, making irregular compression of the model. To prevent this use the cloth (wet) that comes on the sheets of rubber, and open the flask two or three times, removing excess from waste gates. The last time when the flask has come together remove the cloth. Try this plan and see results.—*G. G. Brown, Western Dental Journal.*

TO REMOVE DOWEL-PINS.

When an entire Logan pin, or enough to be grasped, is left projecting from the root, the Lancaster pin-pulling pliers certainly does the work with pleasurable dispatch. If, however, the pin is broken flush with, or below, the root end, about the best and speediest way is to use a S. S. W. trephine, No. 253, which will encircle the pin and cut out the cement around it, the pin acting as a central guide to prevent the trephine going to one side and damaging root. While using the trephine care is necessary to avoid breaking it by sudden side strains, or allowing débris to clog it. The latter may be avoided by removing it two or three times to get rid of the cuttings.—*T. J. McGernon, Dental Hints.*

PERSONAL AND GENERAL

Dr. P. P. Walker, a dentist at Brandon, Miss., died April 14th. He was thirty-six years of age.

Dr. W. J. Lawrence, a dentist of Chicago, died April 9th. He was eighty-four years of age.

Beloit-Janesville Society.—Dentists of Beloit and Janesville, Wis., have organized a dental society.

Discharged.—H. L. Stoncifer was found not guilty of practicing dentistry illegally at Ogden, Utah.

Robberies.—Drs. L. O. Addison, Dayton, Ohio, loss $20.00; C. A. Bushong, Hoboken, N. J., loss $60.00.

Dentist Missing.—Dr. A. E. Hockersmith, a dentist at Chattanooga, Tenn., has been missing since March 3d.

C. T. Brockett, Jr., a dentist of Atlanta, Ga., died April 5th. He was a graduate of the Southern Dental College.

Edger-Ormsby.—Dr. William M. Edger and Miss Lillian Ormsby, both of Chicago, were married March 20th.

C. Scott Reichert, a dentist at Tipton, Iowa, is dead. He recently returned from Cuba where he had contracted fever.

Good Opening For Dentist.—The Marion, N. D., Sentinel declares that a good opening for a dentist exists in that town.

Dr. E. L. Moore, a dentist at Ann Arbor, Mich., was accidently killed April 19th at his summer cottage at Portage Lake.

Arrested for Wife Murder.—Dr. Samuel E. Guy, a dentist at Far Rockaway, N. Y., is under arrest for the murder of his wife.

Dr. E. R. Dixon, a dentist at Pittsburg, Pa., died April 16th. He was thirty-four years of age, and was a native of Natural Bridge, Va.

Dr. W. H. Cooke, a dentist eighty-five years of age, died at Clarendon, Texas, March 17th. He practiced dentistry for many years at Denton.

Psi Omega and Beta Epsilon Fraternities of the New Orleans College of Dentistry held a banquet Oct. 20th. Dr. J. T. Reese acted as toastmaster.

Dr. Thomas J. Borland, a dentist at Milwaukee, Wis., died March 16th. He was forty-two years of age, and had been in poor health for over a year.

Dentist Arrested by Postal Authorities.—Dr. A. P. Sylvia, a New Bedford dentist, was arrested for sending first class mail matter under fourth class postage.

Psi Omega Dental Fraternity of the O. M. U. enjoyed a banquet at the Hartman hotel in Columbus, Ohio, April 20th. Dr. J. N. Brown, of New Albany, was toastmaster.

Dr. Frank C. Wick, a dentist at St. Louis, Mo., died suddenly March 24th. He had practiced dentistry in St. Louis for ten years, and was a graduate of the Washington University.

Dental Fraternity Banquet.—The Omicron chapter of the Delta Sigma Delta held a banquet April 16th at the Planters' hotel at St. Louis. Dr. F. F. Fletcher was toastmaster.

Negro Physicians and Dentists Meet.—The twelfth annual session of the Negro Alabama Medical Dental and Phamaceutical Association was held April 10th and 11th at Burmingham, Ala.

Convicted of Wife Murder.—Dr. E. B. McCoy, a dentist at Caney, Kansas, was denied a new trial by Judge Flannelly March 14th. He was convicted of murder in the second degree Nov. 19th.

Dentist Sues Patient.—Dr. Robert E. Payne, of New York, has brought suit against Mrs. Taylor, the wife of a millionaire theater and real estate owner, for $2,110 for professional services.

Dentist a Hero.—Dr. C. F. Clauson, of Chicago, rescued a companion who was drowning in Fox lake. The accident was caused by the over turn of a boat. One of the members of the party was drowned.

Dentists at Charleston, S. C., have formed an association for the mutual protection of its members. The chief object of the association is for securing payment of bad accounts and to prevent their accumulation.

Dr. A. A. Cook, a dentist at Utica, N. Y., died March 28th. He was forty-five years of age and was born on the premises where he died, and had lived there all his life. He was a graduate of the Philadelphia Dental College.

Dental Famine.—The Duluth Despatch reports a shortage of supply of dentists in that vicinity, Dr. Olson having been injured by the explosion of a vulcanizer and severely hurt and several removals having brought about this condition.

Suggestive Anaesthesia was demonstrated at the Medic-Chirurgical Hospital at Philadelphia. W. E. Hoffman, a student of the junior class, placed another member of the junior class in a hypnotic state and extracted a tooth while the patient was in that condition.

Dental Legislation for Michigan.—The State Dental Association of Michigan has had passed through both houses of the State Legislature a bill to increase the board from three to five members. The bill also carries a very stringent measure for the protection of the profession.

Odontotechnique Society of New Jersey held a successful meeting and clinic April 3d at Newark. Dr. Ellison Hillyer, of the New York College of Dentistry, read a paper on "The Progress, Past and Present of Prosthetic Dentistry." The meeting was followed by a banquet.

Dental Examiners' Annual Banquet.—The New England Association of Dental Examiners held a banquet at Boston Mass. The following were elected as officers for the ensuing year: A. E. Maxfield, of Holyoke, president; Sawyer, of New Hampshire, vice-president, and Midgeley, of Rhode Island, recorder.

Southwestern Michigan Dental Association elected the following officers for the ensuing year: President, O E. Lamphear, of Paw Paw; vice-president, James B. Doyle, of Grand Rapids; secretary and treasurer, C. W. Johnson, of Lawton. Jackson was selected as the place for the next meeting.

Southern Minnesota Dental Society held its 22d annual meeting April 10th and 11th. The following were elected as officers for the ensuing year: President, F. J. Yerke, of Owatonna; vice-president, E. E. Smith, of Plainview; secretary, C. A. Hintz, of Springfield; treasurer, M. B. Wood, of Mankato.

Swallowed Extracted Teeth.—Mrs. Lela Wheeler, of Hartford, Conn., was recently operated on for the removal of teeth which she had breathed into her lungs after extraction two years ago. The patient was in ignorance of the presence of the teeth in her lungs until recently when, after a severe illness, she coughed up several pieces of tooth from her lungs.

Dr. Mark Smith, a former resident of White county ,has had an interesting and profitable experience in his profession of dentistry in India, where he is now located. A letter received from him tells of the recent consultation with him of the ameer, or head ruler.

The ameer's teeth were bad, and he decided to have the American dentist work on them. Representatives were accordingly sent by the government to Calcutta to arrange for the ordeal. About forty horsemen were sent to conduct Dr. Smith and his servant to his majesty. The trip was taken through a mountainous country, and a costly fur coat was presented Dr. Smith before the commencement of the journey. As soon as the teeth of the ameer had been examined, the ruler ordered $6,000 deposited in the government's care at Simla, the summer capital of India.

The work consisted of four gold and six amalgam fillings and was the most expensive dental work ever done. The expense of the trip cost the government over $4,000, and the ameer was so well pleased with the results that he invoked a great blessing to rest on the American dentist.

Removals.—Drs. F. S. Soden from Norwich, N. Y., to New York City; W. W. Gill from Jacksonville, Ill., to Atlantic City, N. J.; E. L. Moore from Sedalia, Mo., to St. Louis, Mo.; M. R. Melvin from Detroit, Minn., to Frazee, Minn.; F. L. Davison from Batavia, Ohio, to Springfield, Ohio; E. Stapleton from North Lake, Wis., to David City, Neb.; R. Bristow from Chicago to Taylor, Texas; William S. Deeley from Sandusky, Ohio, to Mt. Vernon, Ohio; F. Reynolds from Plymouth, Ind., to Goshen, Ind.; W. H. Chapman from Waukesha, Wis., to Milwaukee, Wis.; F. A. Barr from Addison, N. Y., to Binghamton, N. Y.

DENTAL PATENTS

Fig. 1.

832,955. Dental Plugger.—Henry D. Bultman, New York, N. Y., assignor to Consolidated Dental Manufacturing Company, New York, N. Y., a corporation of New York. Filed May 9, 1904. Serial No. 207,049. Claim.—1. In combination, a casing, a tool-holder rod, an anvil thereon, a spring-actuated hammer, a catch carried thereby for locking the

Fig. 2.

hammer to the rod, and a centrally-arranged tripper fitted to engage the catch to release the hammer.

844,079. Dental Matrix.—Ellsworth Armstrong, Collingdale, Pa. Filed July 26, 1906. Serial No. 327,811. Claim.—1. A dental matrix consisting of an operating screw, a clamp swiveled thereto, said clamp having elongated eyes, a curved band, the ends of which are adapted to pass through said eyes, a collar threaded upon the operating-screw, pins projecting from the sides of said collar adapted to engage holes formed in the ends of the band.

Fig. 3.

846,420. Dental Bracket.—Albert W. McKenney, Roxbury, Mass. Filed April 28, 1906. Serial No. 314,182. Claim—1. In a device of the character described, a standard, a rotary cylindrical carrier journaled on said standard, a plurality of holders fast to the periphery of said carrier, said holders each adapted to receive and hold a bottle, and a socket fast to said carrier and adapted to receive and hold a lamp.

Fig. 4.

843,273. Dental Bur and Excavator.—Willy Homann, Dusseldorf, Germany, Filed March 29, 1905. Serial No. 252,621. Claim—A dentist-bur, comprising a spherical head provided with a reduced shank or neck portion, the curve between the head and the shank or neck portion being gradual, said head and shank or neck portion being provided with longitudinally and spirally arranged cutting-ribs having serrations or teeth except at the outer end of the head portion, substantially as shown and described.

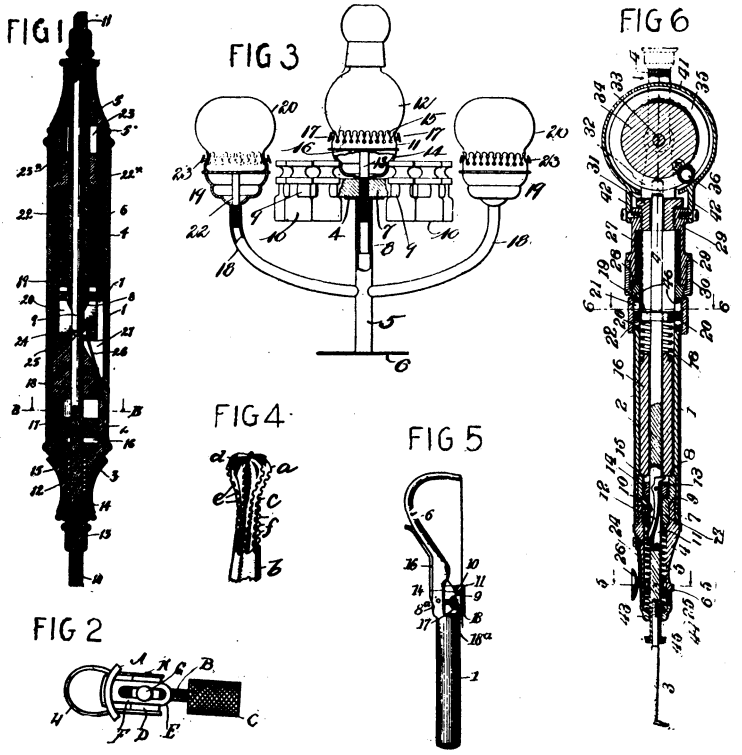
Fig. 5.

844,181. Dental Floss-Holder.—Charles M. Overbaugh, Clarion, Iowa. Filed October 26, 1906. Serial No. 340,675. Claim—1. A dental floss-holder comprising a tubular handle adapted to receive a floss-cartridge, a curved portion extended from the handle; cheek-pieces at the junction of the curved portion of the handle, one of said cheek-pieces having a fixed jaw member, an angle-lever pivoted between the cheek-pieces, and a jaw member operated by said lever.

Fig. 6.

848,334. Combination Dental Plugger.—Percy E. Williams, Savannah, Ga. Filed June 9, 1905. Serial No. 264,534. Claim—1. A dental plugger comprising in its construction a casing having a side opening

through its front end portion, a longitudinally-movable tool-holder in the casing, a coiled spring in the casing acting on said holder to force the same to its limit of outward movement, a circumferentially-grooved collar on said holder with its groove normally opposite said opening, a finger-piece at the exterior of the casing having an inwardly-extending locking projection adapted to project through the opening into said groove to lock the casing and holder against independent longitudinal movement, and a spring normally holding said finger-piece and projection outwardly from locking position.



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